Spreckels SUGAR BEET Bulletin

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AGRICULTURAL DEPARTMENT—SPRECKELS SUGAR COMPANY

Addresses and Telephone Numbers

NAME	TITLE	ADDRESS	TELEPHONE
		SAN FRANCISCO	
Guy D. Manuel	*Vice President and General Agriculturist*	*2 Pine Street*	*Douglas 2-5600*
John M. Kendrick	*Assistant to General Agriculturist*	"	" "
		SALINAS DISTRICT	
George P. Wright	*District Manager*	SPRECKELS	*Salinas 7321*
Harry J. Venning, Jr.	*Asst. District Manager*	"	" "
William H. Paulsen	*Agricultural Superintendent*	"	" "
James E. Gardiner	***Field Superintendent***	"	" "
Harvey W. Parker	*Field Superintendent*	"	" "
Harold H. Voth	*Field Superintendent*	"	" "
Walter L. Gerow	*District Engineer*	"	" "
Dr. R. T. Johnson	*Plant Breeder*	"	" "
Robert E. Flores	***Assistant to Plant Breeder***	"	" "
J. Byron Larsen	*Asst. Agricultural Superintendent*	**KING CITY** *P. O. Box 87*	*King City 602M*
Virgil Horton	*Assistant Field Superintendent*	"	" "
		SACRAMENTO AND SOUTH SAN JOAQUIN DISTRICTS	
Hugh F. Melvin	*District Manager*	**SACRAMENTO** *600 California Fruit Building*	*GI lbert 3-2021*
Ralph S. Lambdin	*Asst. District Manager*	" " " "	" "
William Hodson	*Field Superintendent*	" " " "	" "
Vernon Sherwood	*Field Superintendent*	" " " "	" "
Austin A. Armer	*Agricultural Engineer*	" " " "	" "
Lauren Burtch	*Agronomist*	" " " "	" "
Ernest Moeller	*Assistant Field Superintendent*	" " " "	" "
Julian P. Williams	*District Engineer*	*2811 Fifth Street*	" ***2-0449***
John O. Nielsen	*Asst. District Engineer*	" " " "	" "
W. H. Buckingham	*Agricultural Superintendent*	**WOODLAND**	*Woodland 2-2816*
S. S. Anderson	*Field Superintendent*	"	" "
William Duckworth	*Field Superintendent*	"	" "
Donald R. Hefner	*Field Superintendent*	"	" "
W. B. Marcum	*Field Superintendent*	"	" "
John F. McDougall	*Field Superintendent*	"	" "
John W. Bryan	*Field Superintendent*	**WALNUT GROVE** *P. O. Box 35*	*Walnut Grove 3371*
Dan Dieter	*Field Superintendent*	**LODI** *720 Loma Drive*	***Lodi 8-0594***
N. K. Groefsema	*Assistant Agricultural Superintendent*	**MANTECA**	***Manteca 42***
Tom F. Ryan	*Field Superintendent*	"	" "
Clyde Spencer	*Field Superintendent*	**PATTERSON** *P. O. Box 114*	*Tyler 2-3853*
William Hurley	*Field Superintendent*	**LOS BANOS** *P. O. Box 928*	*Los Banos 2172*
R. Bruce Duncan	*Assistant Agricultural Superintendent*	**BAKERSFIELD** *431 Kentucky Street*	***Bakersfield 4-4904***
J. G. Maurer	*Field Superintendent*	" " "	" "

SPRECKELS SUGAR BEET BULLETIN

THERE'S DANGER IN NUMBERS

Too many beets left at thinning time can reduce yield at harvest time.

SINGLES ARE BEST
DOUBLES ARE GOOD
CLUMPS ARE BAD

Good thinning—by machine or by hand—means avoiding clumps and long gaps. See page 2.

Vol. 18 JANUARY - FEBRUARY, 1954 No. 1
PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

LET'S DO A BETTER JOB OF THINNING

By AUSTIN ARMER
Agricultural Engineer, Spreckels Sugar Company

IT HAS BEEN customary to discuss thinning problems in the pages of this bulletin about the first of every year. For the past three years, mechanical thinning has been in the spotlight, and 1953 saw the first real acceptance of mechanical thinning by beet growers throughout California.

If the many articles in the Sugar Beet Bulletin concerning mechanical thinning have had a part in promoting the adoption of this cost-saving system, we of Spreckels Sugar Company have reason to be pleased. But, if there are growers whose first experiences with mechanical thinning turned out to be something less than ideal, we feel an obligation to point out some of the pit-falls of improper thinning —whether by mechanical or manual methods.

What Is a Good Thinning Job?

Over the past years we have attempted to demonstrate that a field of sugar beets could reach its maximum potential yield over quite a wide range of plant distribution. If a field were capable of producing a 25 ton yield, it would do so whether there was one beet every foot of row or three beets every foot of row. We also pointed out that a few doubles do no harm. In fact, as high as one-half of the beet hills could be doubles without depressing yield. We even went so far as to demonstrate that a few clumps were acceptable, since there was a strong tendency for some beets in the clumps to die, leaving doubles or even singles.

But we must have failed to make it clear that many clumps must inevitably detract from yield, because in the past two years there has been a marked increase in the total number of beets in every acre grown for this Company, and an alarming reduction in thinning quality as evidenced by the huge quantities of tiny beets which arrive at our receiving stations, many of which are removed by our cleaning screens.

Why Clumps Must Be Avoided

Numerous experiments have shown that two sugar beets feeding from the same ground area as one sugar beet will produce the same quantity of sugar. But these experiments also show that 3 or 4 or more beets failed to produce the same sugar as one or two beets. The reason for this becomes very clear when it is realized how rapidly the volume (and corresponding weight) of a beet decreases with a reduction in the diameter of the beet. For example, a beet four inches in diameter weighs over two pounds. Will four beets, each one inch in diameter, weigh two pounds? Far from it—their total weight will be only ¼ pound; it would take thirty-two of these little one-ounce beets to weigh two pounds, and there just isn't room enough in a foot of row to grow that many nubbins. Even if there were, many of them would be lost in the receiving station screens.

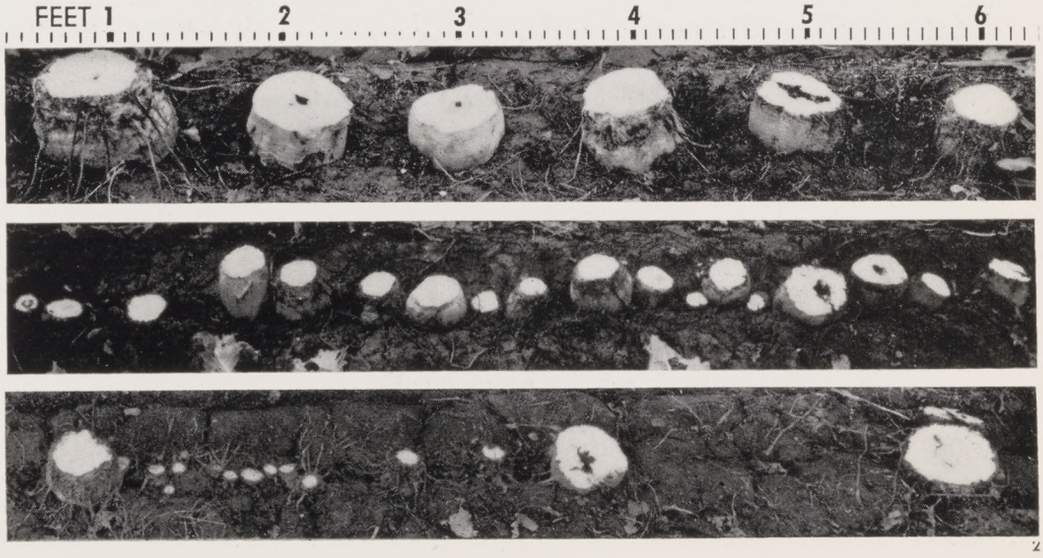
When we do a poor job of thinning and leave a lot of clumps, it is true that many of these individual plants die for one reason or another and we may wind up with a solid row of beets cheek to cheek. But that fortunate circumstance is rare—the result is more apt to be a single medium-sized beet crowded against six or eight nubbins whose total weight is negligible.

Another consequence of clumps is that each of these little beets has a mass of foliage nearly as large as would be found on a large beet. All of this foliage consumes soil moisture and nutrients; competes with the neighboring large beets and yet yields negligible sugar. In other words, every beet below marketable size is a weed—which wastes water and fertilizer, and competes with the marketable crop.

Gaps Depress Yield

The many experiments in beet population which have been performed through the years in all parts of the world show that beet population less than 25,000 per acre to not take full advantage of the soil's productivity.

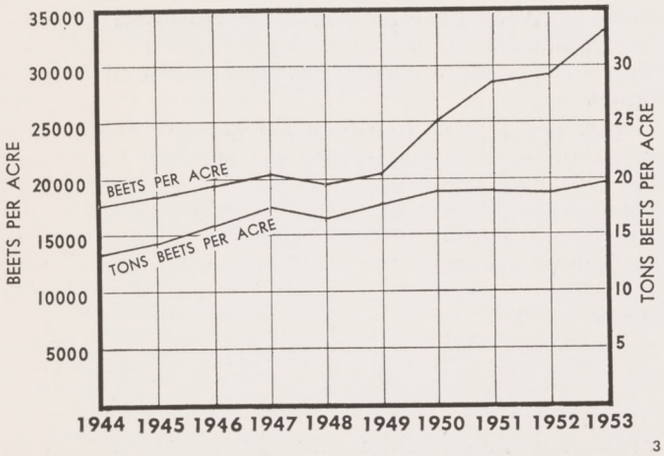
This population corresponds to an average spac-



NICE WORK—if you can get it. This is the traditional ideal stand —one beet every 12 inches (on rows averaging 20 inches apart).

NICE ENOUGH—and you can get it. This is the result of mechanical thinning on a uniform seedling stand. Yield—the same as above.

NOT NICE—don't let it happen. This is the result of badly managed mechanical thinning—worthless clumps and long gaps reduce yield.



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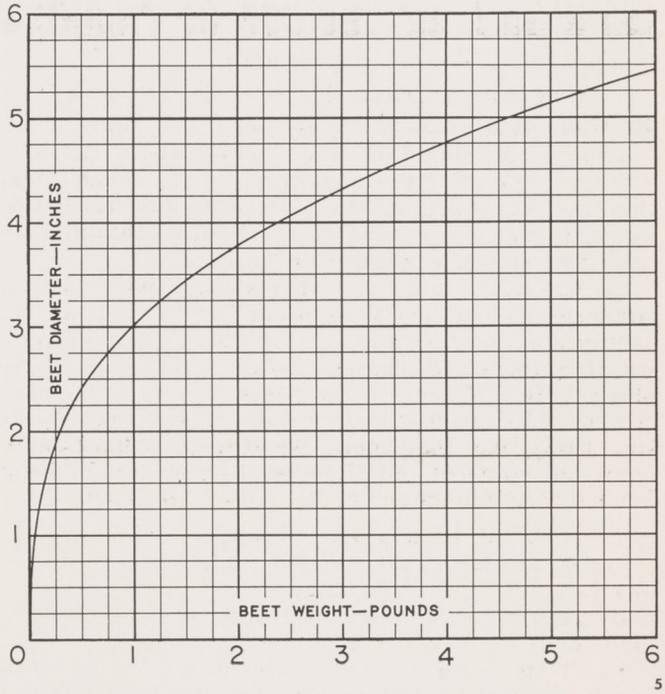
THROUGHOUT the years before 1950, beet populations in the Sacramento and San Joaquin Valleys were below the critical value of 25,000 beets per acre, and yields were directly affected by low populations.

But in 1950, with an average population of just 25,000, yields reached a new high which has scarcely been exceeded despite the big increase in population, which reached 33,000 in MARKETABLE beets in 1953. In addition, an estimated 6,000 UNMARKETABLE beets averaging only one ounce in weight were harvested from every acre, but never reached the factories.

This enormous number of tiny, worthless beets cost their growers heavily in water, fertilizer, and competition with the marketable crop. Better quality of thinning can overcome this serious loss in net return.



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LITTLE BEETS don't weigh much. This actual (not theoretical) curve shows that beets under 1½ inches in diameter weigh less than 2 ounces.

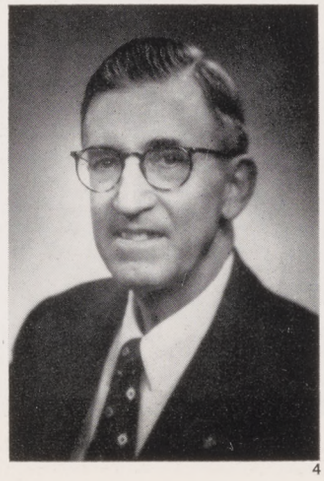
ing of a little over 12 inches between beets, planted on rows with an average spacing of 20 inches. In more forceful language, that means that every inch over 12 which separates any two beets in a field represents wasted land. There is no use arguing that beets on wider spacing grow big enough to compensate for the reduced population. They compensate partially, but not entirely; and when gaps exceeding two feet in length become frequent throughout an entire field, that field will produce far less than its potential maximum yield.

Thinning Is a Major Factor In Yield

If growers would realize that the day on which a row of beets is thinned is the day on which the final yield for that row is determined, they would probably do a better job of thinning supervision. It makes no difference whether thinning is done by hand or by machine—every gap and every clump will forever reduce the ultimate yield. Sugar beets have a lot of tolerance for row spacing if they are no farther than 12 inches apart and no closer than 4 inches. But if they are spaced much farther than 12 inches, or much closer than 4 inches, they will find their revenge in markedly reduced yields. So if your row spacing averages 20 inches, try to thin to singles and some doubles, with six to ten inches between hills. If the rows are wide-spaced (28 to 32 inches), space the hills four to seven inches apart. These spacings are close enough to allow some future mortality from insects, disease and cultivator-drivers, yet still leave a population capable of maximum yield.

USDA BEET SPECIALIST RETIRES

NAHUM J. GIDDINGS, Senior Pathologist of the Division of Sugar Plant Investigations, who was stationed at Riverside, California, retired on November 30, 1953, after twenty-four years of service in the Federal Government. Giddings, during this period of service, has been engaged in research on the nature of curly top, the virus diseases that once threatened extinction of the western beet sugar industry.



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He was born in Ira, Vermont, November 13, 1883, and was educated at the Universities of Vermont and Wisconsin. He received the Doctor's degree from the latter institution in 1918. He was a student of the late Professor Lewis R. Jones, pioneer and recognized leader of the field of plant pathology, studying under him at Vermont and later at Wisconsin at the newly established Department of Plant Pathology there. As pathologist in West Virginia, Giddings became an authority on the rust of apples and the bacterial diseases of plants.

In the department of Agriculture he specialized on plant viruses. In this field he discovered that the curly top virus of sugar beets is not a single entity, but breaks up into strains some of which are very much more virulent than others. He isolated many strains and determined their reactions.

Dr. Giddings expects to devote the next few months to completion of some unfinished problems related to the curly top virus.

MAKE THE BEST USE OF YOUR LAND

By HARRY J. VENNING, JR.
Assistant District Manager, Spreckels Sugar Company

THERE HAS BEEN considerable discussion and publicity the past several months of the falling price level of farm commodities. As this condition develops, the importance of the farmer's ability to become more efficient increases greatly. Methods available to the grower to achieve this end are usually known but not always followed in periods of high prices. This article is intended to serve as a reminder or check list for evaluating today's operations by attempting to improve all possible efficiencies.

Leveling land is naturally a major operation and of primary importance on irrigable land with intensive cropping. Many ranches have holes and swales which are completely lost for any crop production and an expense to farm around. The cost of filling these areas can soon be repayed from crop returns gained by the increased acreage made available.

An excessive number of large trees scattered throughout a field is another source of reduced farm land. An even more serious loss of ground is that caused by dead or fallen trees, with farming operations being formed around these wasted areas.

Border tree rows around a field are of questionable value as wind breaks. Large trees can cause considerable shading effect and their wide spreading root systems remove plant food and moisture at the expense of the growing crop. Where some form of wind break is essential, there are shrubs and sturdy perennials available for this purpose that are not so detrimental to row cropping.

Unused canals and ditches can yield a surprising amount of available farming land at very little expense and at the same time, eliminate a weed and pest hazard. In many cases, filling of the old existing canal and replacing with a smaller sized ditch will perform a saving operation.

The ideal answer is, of course, the laying of under-ground concrete pipe-line, making all the area available to farming. Canals or ditches, on the other hand, may prove of value in land retention where parts of a ranch are lost to excessive moisture and poor drainage. In such cases, the ground lost to ditches may reclaim sufficient land to pay good dividends.

The removal of unnecessary fences affords one of the greatest opportunities for efficient land use. The resulting elimination of weeds and pests from this operation is of immeasurable value. This boundary removal makes for increased land usage through the lack of necessity for headlands, and allows crop production to take place nearer the deeded property line.

A common loss of ground found on many ranches is in the form of unused and dilapidated houses, barns, sheds and corrals. These areas again are a source of many pests, such as gophers and squirrels, as well as a breeding place for weed seeds.

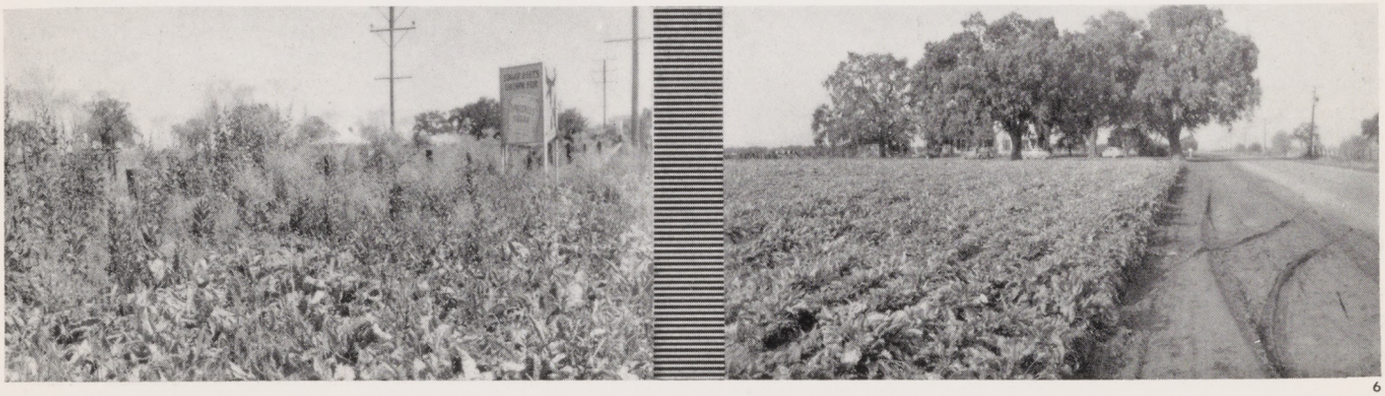
In many cases it is found that roadways are too numerous and excessively wide for performing the required operations on the ranch. The straightening out of winding roads across farm land, or better yet, relocating to achieve the shortest possible distance and reduce total area taken out of farming will more than cover the cost of making the change.

Very often, right-of-ways along railroad lines, highways, county roads and irrigation district canals and ditches produce an area that by surveying and leveling, can bring considerable land under cultivation.

Collectively, the above mentioned possibilities will in some cases add enough farmable land to have a very definite effect on the net returns at the end of the year—and more importantly, for many years in the future.

The subject of efficient land usage must include the securing of maximum stands or full plant population per acre. For example, a six foot gap in every hundred feet of row would mean—almost—a 6% reduction in productive acreage. (See "Let's Do A Better Job Of Thinning" on page 2 of this issue.)

This same thought should be applied to full and effective cultural operations throughout the season, ever keeping in mind the search for possibilities of cutting costs and adding to productivity.



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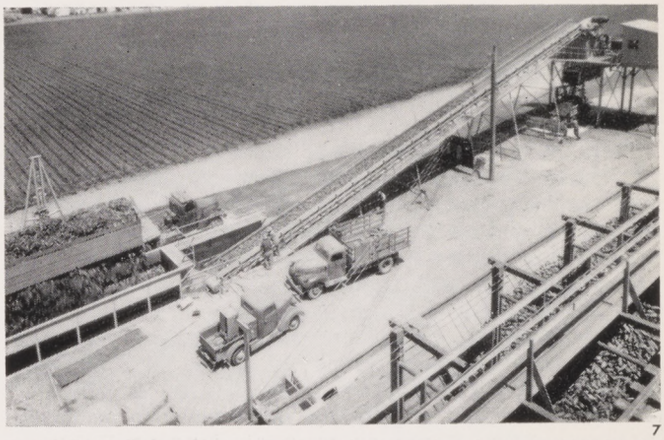
FENCES (Left) reduce net acreage and invite weeds which cannot be controlled. Cleaner fields (right) and more net acreage are the result of eliminating fences and cultivating the crop right up to the property line.

RECORDS BROKEN IN 1953 FALL HARVEST

By GUY D. MANUEL
Vice-President and General Agriculturist,
Spreckels Sugar Company

TO THE GROWERS of beets for the Spreckels Sugar Company, we extend our congratulations. At the close of the 1953 Fall Campaign, deliveries of beets set an all-time high—a record which is testimony of skillful farming and the exploiting of a productive growing season, with an almost rain-free harvest period.



A NEW TRUCK receiving station helped to speed up beet receiving at the Spreckels factory. Its 28 foot hopper is the largest on record.

Yield Records Fall

Growers in both the Salinas and Sacramento-San Joaquin areas produced crops which broke all previous yield records for their districts. In the Salinas district, the average yield was 23.7 tons per acre. In the Sacramento-San Joaquin areas, the average yield was 19.8 tons per acre. In both districts the average sugar per acre was exceeded only once in the past. We anticipate that the Honor Roll (growers producing over 25 tons per acre) will list a larger number of names than ever before. This list will be published after completion of spring harvest.

Longest Continuous Harvest On Record

Harvest started on August 3 in the Sacramento-San Joaquin district, and on August 4 in the Salinas district. Harvest continued until January 15, 1954. The outcome of this harvest was that many of the beets which might have been held over for Spring harvest, were processed during the Fall Campaign. This extended campaign has made it possible to accommodate all of the Spring harvest beets at the Woodland Factory alone. Operation of this factory will start in mid-March, weather permitting.

Receiving Facilities Improved

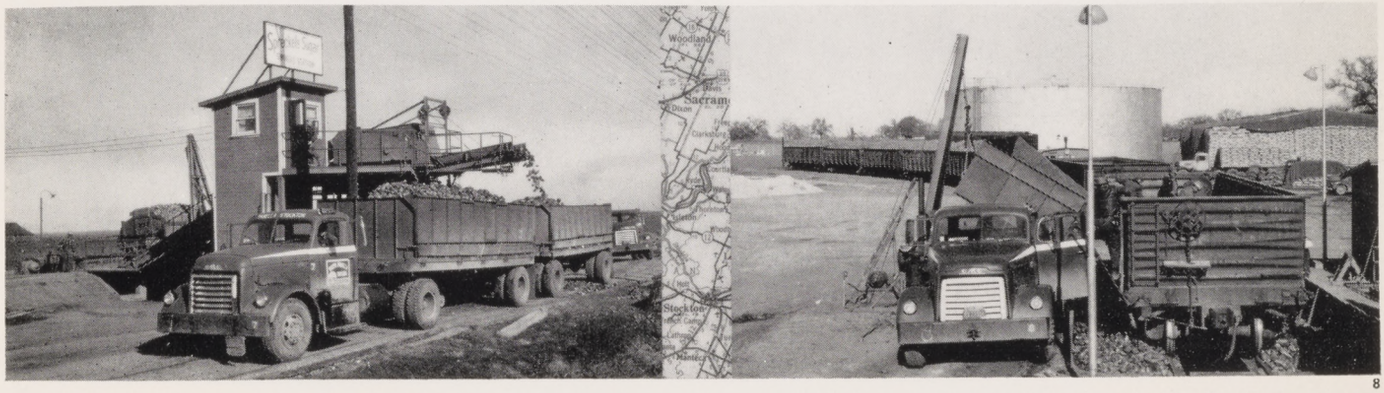
Improvements at the Spreckels factory included a new truck dump (with a road-level receiving hopper—the longest in use), new electrical power facilities and a pair of impressive sugar silos.

A new truck dump was also installed in the Manteca factory to speed the receiving of growers' trucks.

Beet receiving at the outside dumps was facilitated by the increased use of transport trucks. A significant percentage of the tonnage ordinarily shipped by rail was accommodated by these trucks, with a corresponding improvement in the continuity of service at rail receiving stations, together with speedier delivery and better condition of beets as received at the factories.

We of the Spreckels Sugar Company are, of course, pleased with the outcome of the 1953 fall harvest. But our greatest satisfaction stems from the splendid job of farming which all of our growers have achieved and the orderly manner in which they all cooperated toward the accomplishment of this record-breaking harvest.

We have every reason to believe that the spring harvest will be equally successful.



TRANSPORT TRUCKS assisted the railroads by handling over 100,000 tons of beets in 1953. These trucks were dumped at the Woodland car unloading hopper, leaving the regular truck receiving station free for growers' trucks.

U.S.D.A. PLANS RESEARCH CENTER ON BEETS AT SALINAS

By C. H. WADLEIGH*

"THE OLD order changeth, yielding place to new." These timeless words of Tennyson are the keynote to the present state of affairs in sugar beet research carried on by the U. S. Department of Agriculture in California. It is important that everyone concerned with beet production in the Golden State have an advanced look at the plans.

Laboratories, greenhouses, and other research facilities have become available at the U. S. Rubber Research Station located in Salinas as a result of retrenchment in the guayule program. We in Sugar Plant Investigations are taking advantage of this situation by concentrating several lines of research at that station.

For the past twenty-five years, the center of research on the worst menace ever to threaten the beet crop—curly-top—has been at the U. S. Sugar Plant Field Station in Riverside, California. Due to the discontinuance of available facilities there, Dr. C. W. Bennett and his staff will transfer to Salinas. Dr. Bennett is recognized the world over as a leading authority on the virus diseases of plants, and he and his associates will continue their studies on the nature of the curly-top disease, as well as initiating research on virus yellows of beets. The symptoms of the latter disease have been rampant in the beet fields of the Salinas Valley for the past several years.

California beet growers have long been concerned over the ravages of nematodes. The use of rotations and soil fumigants has not been completely satisfactory from the economic standpoint in controlling these pests. Plant breeders have had some success in developing varieties resistant to nematodes among a few other crops. Although the probability of success in breeding beets having nematode resistance is not high, the accomplishment would have tremendous benefits to the beet grower. Thus, research effort to this end is justifiable and urgent. Dr. W. H. Tysdal, one of the leading plant geneticists of the United States and now in charge of research on guayule at Salinas, will join U.S.D.A. Sugar Plant Investigations next July 1st to assume leadership in the breeding of beets for nematode resistance. He will make use of wild types of beets known to carry resistance to these tiny animals. Dr. Tysdal realizes that the road to success in this venture is long and difficult, but experience has shown that few things are impossible to diligence and skill.

Dr. J. S. McFarlane will continue the good work he has been doing at Salinas for the past several years in breeding for bolting resistance in sugar beets, in addition to developing resistance to such diseases as curly-top, rust, and mildew. His work is

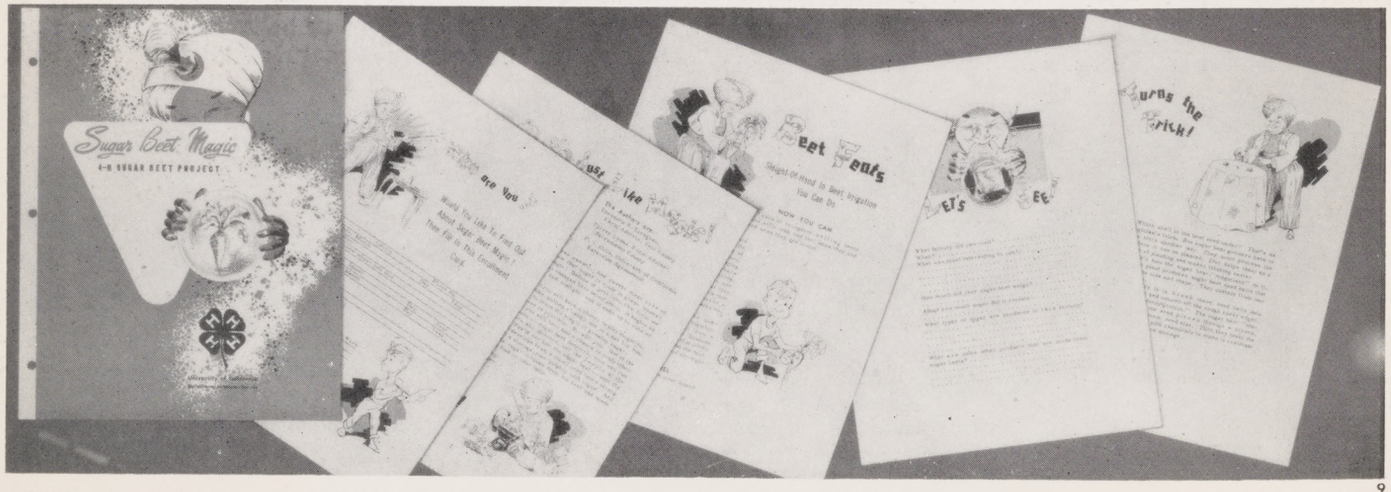
*Head Physiologist in Charge, Sugar Plant Investigations, Field Crops Research Branch, Agricultural Research Service, U. S. Department of Agriculture.

4-H SUGAR BEET PROJECT SPURRED BY NEW U.C. PUBLICATION

"SUGAR BEET MAGIC" is a handsome new booklet created by the Agricultural Extension Service to aid 4-H Club members in carrying out a sugar beet project.

The booklet represents a new approach . . . its purpose is to help the young 4-H'er to have fun while learning about sugar beets. It does not require ownership of land or equipment. The club member has fun seeing how sugar beet "magicians" (farmers and sugar company men) grow and process sugar beets. He practices many of the things they do on various farms in his community. He goes on field trips to visit a beet seed processing station and a sugar factory. To top it off he builds a handsome display board on which he exhibits many of the processes he has learned.

Spreckels field superintendents, as well as County Farm Advisors, stand ready to give personal advice to all youngsters interested in the 4-H sugar beet project.



"SUGAR BEET MAGIC" is a profusely illustrated booklet packed with interesting instructional material for 4-H club members. A few sample pages are shown above. This publication is aimed at having fun while learning about sugar beets.

closely associated with the research program directed by Dr. F. V. Owen at Salt Lake City. Following the transfer of the Riverside group to Salinas, Dr. McFarlane plans to enlarge his breeding program to include work with Dr. Bennett in developing strains of beets resistant to virus yellows. In fact, we anticipate that the entire group of sugar beet technologists to be stationed at Salinas will work together as a team in addition to developing close liaison with the Davis campus of the University of California.

At Brawley, California, Mr. Charles Price will continue his agronomic investigations on beets to meet the special requirements of the Imperial Valley. His work is also tied into the curly-top breeding program centered at Salt Lake City.

It may be of interest to the reader to look at the national scope of research on beets carried on by the

(*Concluded on next page*)

SUGAR BEET TECHNOLOGISTS MEET AT DENVER

THE EIGHTH General Meeting of the American Society of Sugar Beet Technologists convened at the Shirley-Savoy Hotel at Denver, February 2 to 5.

This society was formed in 1937 in order to create closer cooperation between research experts throughout the beet-sugar processing industry as well as government and state agencies. Since 1938 meetings have been held on alternate years, with attendance from every beet growing section of the United States as well as many areas of Europe.

The 1954 meeting just concluded at Denver stressed five branches of sugar beet technology—Agronomy; Genetics and Variety Improvement; Entomology and Plant Pathology; Agricultural Engineering; Chemistry and Factory Operations, and Physiology.

The meeting was initiated with a general session attended by nearly 500 members of the society. The keynote speaker was Alex Drier, NBC News Commentator and world traveler.

The Agronomy Section presented papers dealing with fertilizers, soil conditioners, irrigation practices, planting dates, rotations and population studies.

The Genetics and Variety Improvement section presented the results of research in sugar beet hybrids bearing the monogerm characteristic, as well as higher yields and sugar content. Selections were described having resistance to Curly Top, Bolting and Virus Yellows. Preliminary work on breeding resistance to Nematode was discussed.

The Entomology and Plant Pathology section discussed studies on the migration and control of sugar beet leaf hopper, studies on the problem of virus yellows and the reports on new insecticides and fungicides.

The Agricultural Engineering section stressed sugar beet seed processing, planters, thinning methods, crop cultivation, harvester improvements, top recovery methods, and beet receiving problems.

The Chemistry and Factory Operations section covered the subjects of fuel economy, methods of increasing factory capacity, automatic operations of many factory stations, waste water disposal and laboratory techniques for quality control throughout the sugar making process.

The Physiology section was initiated at this meeting. Papers presented at this section covered the basic sciences relating to the growth of the sugar beet plant, its nutrition, respiration, and behavior to moisture, as well as the effect of sugar beet by-products on animal nutrition.

Spreckels Sugar Company was well represented in the fields of both agriculture and factory operation. Spreckels employees gave numerous papers relating to both subjects.

C. E. CORMANY, President, A.S.S.B.T. 1952-53

ALEX DREIER, N.B. C. News Commentator, Keynote Speaker

DAVID HAMIL, Speaker of the House, Colorado State Legislature

AUSTIN ARMER, General Program Chairman, 1954 Meeting

JAMES H. FISCHER, Secretary-Treasurer 1954-55

PHILLIP B. SMITH, President, A.S.S.B.T. 1954-55

F. V. OWEN, Vice President A.S.S.B.T. 1954-55

THESE ARE some of the men who participated in the Eighth General Meeting of the American Society of Sugar Beet Technologists, held at Denver, February 2-5, 1954.

U. S. D. A. Sugar Plant Investigations. The center of breeding for curly-top resistance will continue to be at the U. S. Sugar Plant Field Station in Salt Lake City under the direction of Dr. F. V. Owen. His research has been one of the prime exhibits on thwarting a plant disease through breeding resistant varieties. About ten years ago, Dr. Owen discovered the characteristic of male sterility in beets. He is continuing to study this character and establish it in certain strains of beets since it provides a most effective means of producing hybrid sugar beets. Considerably more research will be necessary before hybrid varieties will be available to the grower, but the plant breeders of the various sugar companies are working steadfastly to this end.

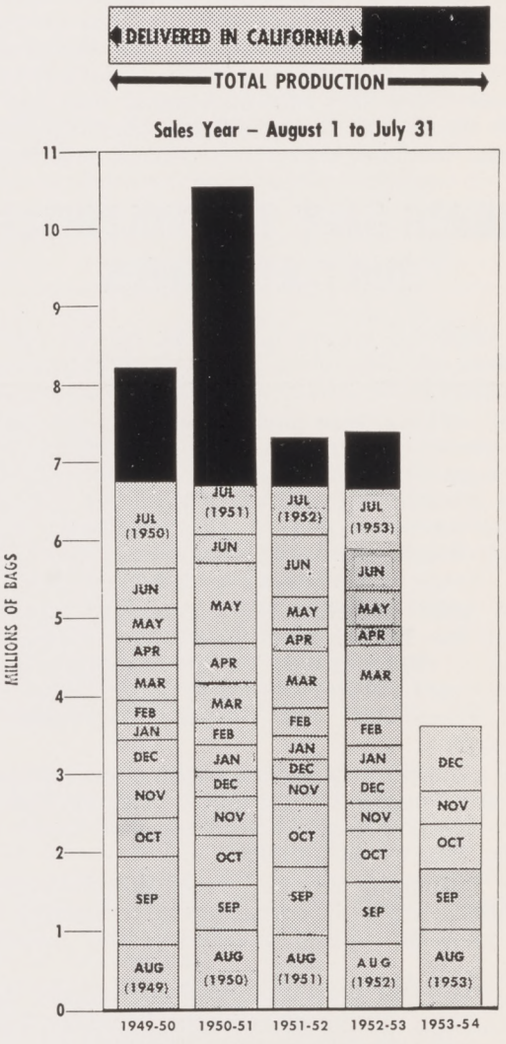
In association with Dr. Owen at Salt Lake City, Drs. V. F. and Helen Savitsky are carrying on research to establish the monogerm characteristic into commercially usable strains of beets as well as studies on basic beet breeding techniques. The work of these two scientists is supported by the Beet Sugar Development Foundation, a non-profit organization established by the beet sugar companies to support sugar beet research.

U. S. D. A. Sugar Plant Investigations is expanding at Fort Collins, Colorado, where Dr. Leroy Powers will join the group. Dr. Powers is recognized as one of the top-flight plant geneticists and he was at one time in charge of the beet breeding research of the Spreckels Sugar Company. At Fort Collins, Dr. Powers will concentrate the development of inbred lines of beets carrying different biochemical compositions associated with varying degrees of quality. He will study the mode of inheritance in beets of the factors which determine the quality of product the beet grower produces. Sugar beet technologists are in agreement that considerable progress could be made in improving the quality of this crop.

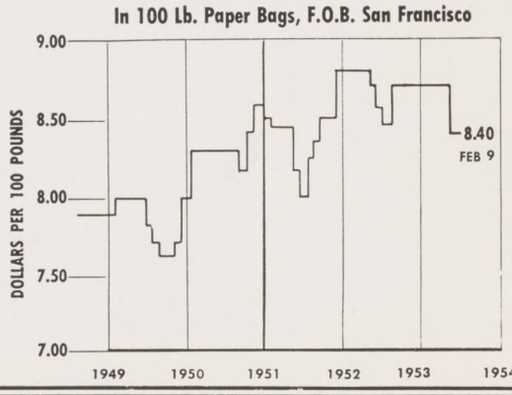
In the east, at Beltsville, Maryland, Dr. G. H. Coons will continue his leadership of extensive research on the leaf-spot and black root diseases of beets in addition to fundamental studies on virus yellows which he initiated a few years ago. In association with Dr. Coons, Mr. Dewey Stewart is carrying on major breeding program to develop and combine resistance to leaf-spot and black root. This research has culminated in the recent release of US 400, a new variety of beets that is especially adapted to the Michigan-Ohio area where these two diseases are widespread.

It should be emphasized that the research carried on by U.S.D.A. Sugar Plant Investigations is closely coordinated with that carried on by the beet sugar companies through a formal Memorandum of Understanding with the Beet Sugar Development Foundation. This means that there is a very minimum of duplication in effort in the overall program so that publicly appropriated funds may have a maximum of usefulness.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA

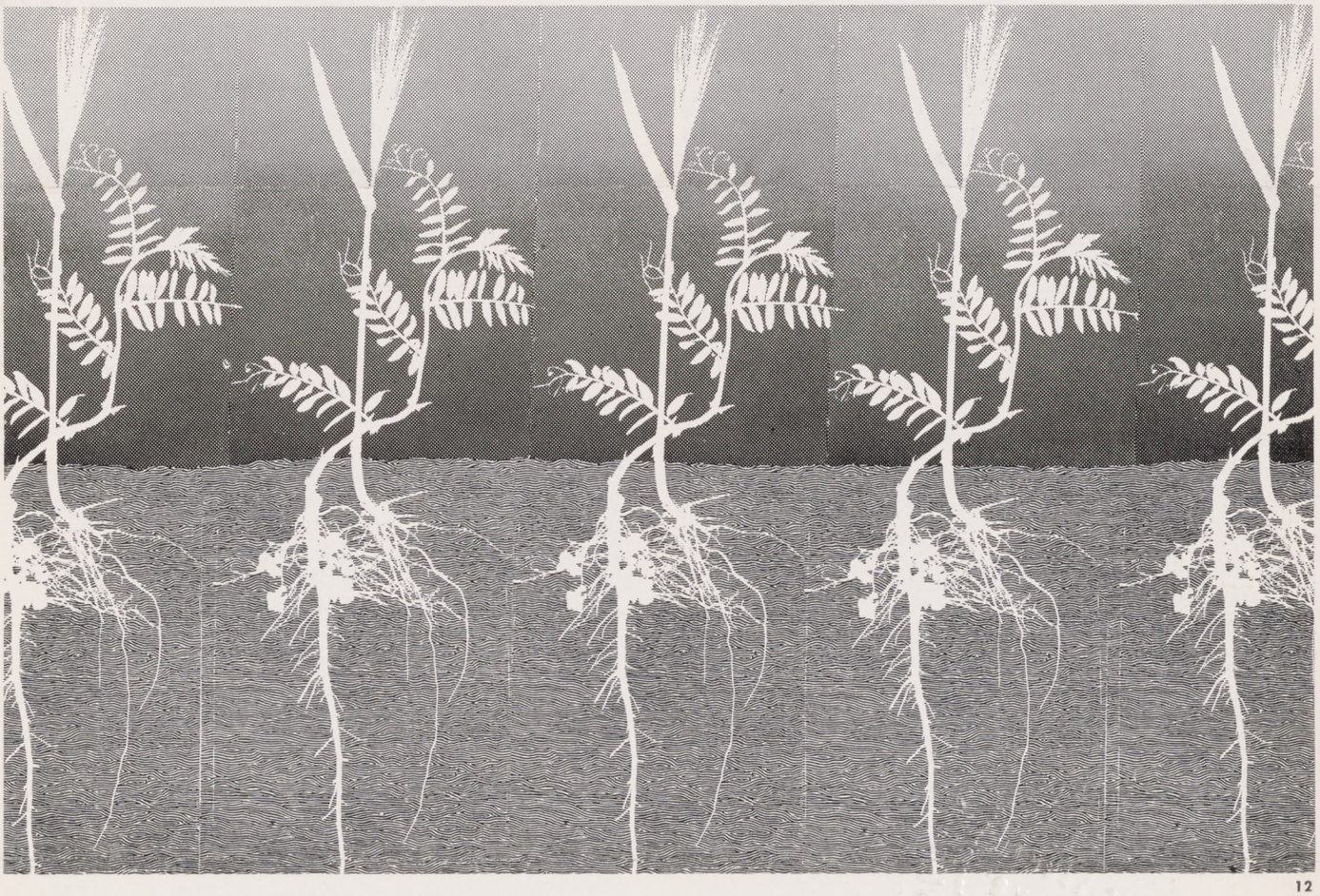


QUOTED PRICE OF BEET GRANULATED SUGAR



The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN



12

COVER CROPS BUILD GOOD SOIL

A consistent program of cover cropping will provide permanent gains in

WATER-HOLDING CAPACITY

FERTILIZER ECONOMY

SOIL TEXTURE

These benefits are cumulative, and lead to soil improvement—not problems.

See page 10.

Vol. 18 MARCH - APRIL, 1954 No. 2

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

GREEN MANURES INCREASE SUGAR BEET YIELDS

By W. A. WILLIAMS
Assistant Agronomist, University of California

THE USE of green manure crops has been a common practice in California agriculture for many years. However, information developed in controlled experiments relative to their value and the nature of their effects on soils and subsequent crops is limited. This is in large part due to the wide variation in soil conditions, climate and cropping sequences which limit the application of results determined under a particular set of circumstances. The field experiment discussed here is the first of a series of tests conducted by the Department of Agronomy, University of California, which are designed to evaluate the influence of various green manure crops on the growth, nutrition, and yield of several field crops and accompanying physical and chemical changes in the soil, and disease and pest effects.

The experiment was established following a crop of potatoes on Yolo sandy loam near Santa Maria, located in one of California's coastal valleys[1]. Six replications of strips 20 feet wide of Hero barley, purple vetch, and a mixture of barley and vetch were planted across a small field on September 14, 1951, and sprinkled up. The seeding rates in pounds per acre were barley—80, purple vetch—45, and barley and vetch—10 and 40 respectively.

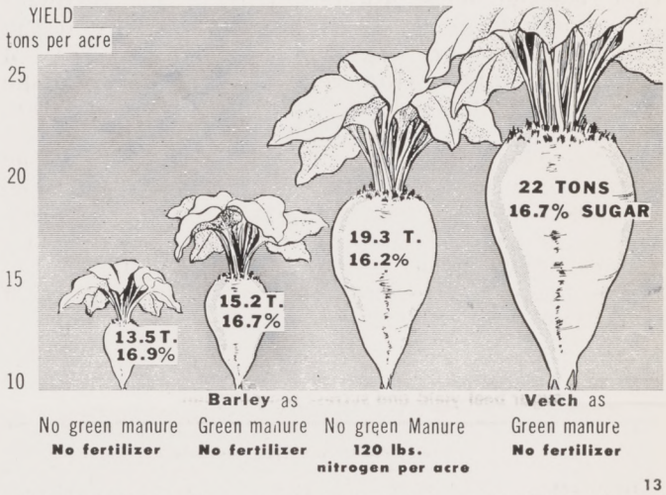
Just prior to turning under the green manure crops, strips were cut to determine the amount of organic matter produced and its nutrient content. The barley, a non-leguminous green manure crop, produced the most green manure; the vetch produced a little more than half as much. The vetch, a leguminous green manure crop, contributed almost twice as much nitrogen to the soil in the top growth as did the barley. The barley and vetch mixture was intermediate for both green manure and nitrogen production.

Table 1. Dry matter production, nitrogen content, and amount of nitrogen turned under in green manure.

Treatment	Dry matter turned under lbs./acre	Nitrogen content %	Nitrogen turned under lbs./acre
Fallow	0	—	0
Barley	4,950	1.2	62
Barley and vetch	3,690	2.2	87
Vetch	2,620	3.9	115

The green manure crops were plowed under to a depth of 10 inches on January 29, 1952, and sugar beets were planted on February 5, 1952. Differences in the growth of the sugar beets were evident by thinning time. A growth sample, taken on April 30,

[1] This experiment was conducted with the cooperation of F. J. Hills, Extension Specialist in Agronomy, Dr. David Ririe, Assistant Agronomist, and Harwood L. Hall, Farm Advisor, University of California, on the ranch of Owen S. and Owen T. Rice, who performed all the cultural operations.



13

THE BENEFITS of various cover crop programs are graphically demonstrated by these data from actual field trials.

1952, indicated that the beets which followed vetch had made four times as much growth as those on the fallowed plots (table 2). The growth following the barley and vetch mixture was about three times that following fallow, and the growth following barley was a little greater than that following fallow. These differences were correlated with the amount of nitrogen turned under in the green manures. Data from the analyses of petiole samples taken at thinning time showed that the growth differences were closely associated with the level of nitrate-nitrogen in the plants, further indicating that nitrogen nutrition was the primary limiting factor involved.

Table 2. Effect of green manure crops on sugar beet seedling growth and concentration of nitrate-nitrogen in beet petioles.

Treatment	Fresh weight gm./top	Nitrate-N p.p.m.
Fallow	7.1	980
Barley	12.0	2,060
Barley and vetch	20.9	4,790
Vetch	27.9	8,150

The growth differences demonstrated by the growth measurements at thinning time were maintained up to the harvest on the unfertilized plots. The yields of clean beets obtained at harvest time on September 10, 1952, show that the vetch green manure increased the root yield by 8.5 tons per acre with no appreciable drop in sucrose concentration (table 3). The barley and vetch mixture increased root yield by 5.4 tons, and the barley 1.7 tons. Three of the replications were fertilized at thinning with 120 pounds of nitrogen per acre, approximately the same amount of nitrogen as was turned under in the vetch crop. This increased the yield on the fallow plots but did not increase it as much as the vetch green manure. This may be accounted for by the fact that the fallow plots were nitrogen deficient prior to fertilization and never caught up in growth with the beets on the vetch plots. The highest yields were obtained on the barley-vetch and vetch plots

that received the additional nitrogen. The fertilizer nitrogen maintained the nitrate-nitrogen level in the plants above the critical level of 1,000 p.p.m. for an additional month. However, the increased tonnage was accompanied by a 1.0 percentage point reduction in sucrose concentration. There was no significant difference between the fertilized barley-vetch and the fertilized vetch treatments, indicating that 120 pounds of fertilizer nitrogen plus 87 pounds of nitrogen in the barley-vetch green manure was adequate for maximum yields. However, fertilization produced a significant and profitable yield increase on all of the green manure treatments.

Table 3. Effect of green manure crops and nitrogen fertilization on sugar beet yield and sucrose concentration.

Treatment	Beet yield (tons/acre)		Sucrose concentration (%)	
	No N	120 N	No N	120 N
Fallow	13.5	19.3	16.9	16.2
Barley	15.2	23.2	16.7	16.3
Barley and vetch	18.9	27.1	16.6	15.6
Vetch	22.0	26.6	16.7	15.7

To obtain information on the effect of the green manure treatments on soil structure, the rate of infiltration of water into the furrows between the beet beds was measured. This criterion was used because it is a characteristic that is very sensitive to the physical condition of the soil, and also because water penetration is a problem on many soils and a factor of direct interest to the grower. No significant effect of the green manure treatments on water infiltration was observed. However, the average rate was 0.33 inches of water per hour, a very low rate for a soil of a sandy loam texture. Moreover, as the beets approached maturity they often wilted in large irregular spots throughout the field. Close examination of many of these spots showed a densely compacted zone between the 10- and 20-inch depths. Many of the beet tap roots were deformed by this condition. At harvest the numbers of deformed roots were counted and found to be 9 per cent of the total, but the number was not reduced by any of the green manure treatments. Hence, on the basis of two types of observations it is evident that the soil structure of the plow pan was not significantly influenced by any of the green manures.

The relationship in this experiment between yields and nitrogen turned under in the green manures and their effect on nitrate-nitrogen content of the sugar beet petioles show that the main influence of the green manures was in furnishing needed nitrogen. The legume, purple vetch, planted alone provided the most nitrogen for turning under and in the absence of fertilizer nitrogen produced the most sugar. Additional field experiments using sugar beets as a test crop are in progress in the Sacramento Valley, Imperial Valley, and Santa Maria Valley to study the various effects of green manures under different climatic and soil conditions.

TOOLS FOR THE FARMSHOP

By RALPH PARKS
Extension Specialist in Agricultural Engineering, University of California

A FARMSHOP should pay its own way. It can if the right person uses it and there is needed work to be done. Well over half of all crop production costs go into labor, power and machinery. A well-organized shop will help reduce field labor costs with better tools, reduce power costs with more efficiently running tractors, and help keep all machines in the field instead of in the repair shop.

What is needed most in a farmshop? To start with the simpler tools, a heavy vise mounted on a strong workbench probably is used more often than any other tool in the shop. Here bending and fitting is done. Metal is held for drilling and all sorts of operations. A vise takes the place of the anvil in the older shop. The anvil and forge are seldom used in the modern layout—nor is the old hinged blacksmith vise, with its never-parallel jaws.

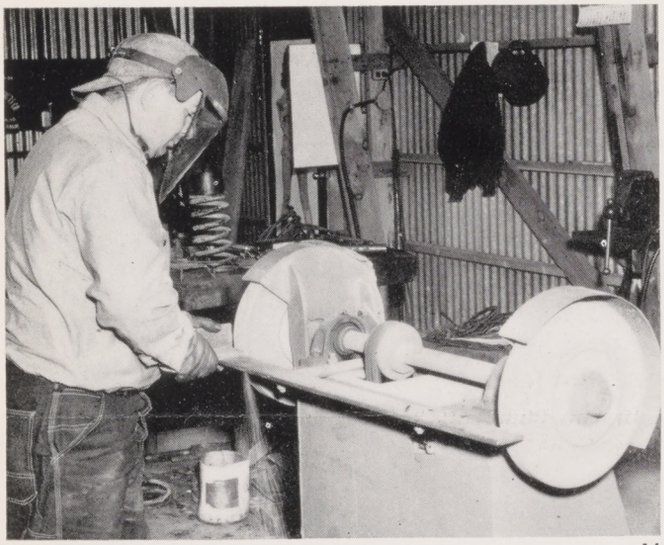
Hammers of all sizes are essential—from a small ball peen hammer for riveting to a 16 pound "persuader" for heavy bending and straightening. They should be located for easy access. Some will go into portable tool boxes, some in wall cabinets, others will stay with certain machines. It is important that handles be kept tight, replaced when split, and wiped free of grease after use.

Wrenches need special care in a shop. A good mechanic who likes and understands wrenches needs a lot of sockets, box-ends, and other special ones. The ordinary ranch hand will soon spoil wrench sets through breakage and loss. He needs to learn on heavier and more rugged equipment. He can be started by loosening nuts which have had the shoulders scuffed off with pliers. Even when square nuts were used on farm machines, pliers were poor substitutes for wrenches. Now with hexagon nuts and cap screws, put in out of the way places, it is even more important to use the correct wrench and use lock washers where needed.

Cold chisels often save time and work on old and rusted machines. Provided you have a ready supply of replacement bolts and nuts, it is often safer and easier to cut a nut from a bolt than to risk good wrenches in breaking the nut loose. Here is where the right hammer and cold chisel come into play. If your aim is poor, use a pair of pliers to hold the cold chisel.

A ½ inch portable electric drill is certainly handy for many repair and modification jobs. A larger and more expensive one is justified at many headquarters. Don't forget the cutting oil to keep the cutting bit cool. Have a good assortment of drill sizes to clear the bolts you commonly use, and have a place to display them. Don't let them be thrown around in boxes. A "starter" set of drills will all be 1/16" larger in diameter than the standard bolts, and should be high-speed steel.

An electric bench grinder is a necessary power tool in any shop. It can go on the end of the workbench away from the vise. However, you will find



U. of C. Photos by Frank Ernst 14

A MANDREL GRINDER, with plenty of horsepower, cuts fast and clean. A bench grinder should be reserved for small tool sharpening, and face shields provided for both.

that many of the larger shops mount the grinder on a separate pedestal away from other tools. This is for convenience in getting larger pieces of metal to the grinder. **Dont forget the goggles or face shield.** Hang them over the grinder and **insist** that every user wear them. A lost eye is not comparable with all the work a careless mechanic does. You might find two or three grinders are useful. Pick carefully for the first one. It needs a tool rest. Probably its first job will be in sharpening drill bits, then it will be used for chisels and other sharp-edge tools. Keep a can of water handy for cooling the metal being ground. Contrary to popular belief, grinding wheels once called "emery wheels" do not remove the temper from tools. The operator does that by holding the tool on too long without cooling it in water.

Everyone wants to own an arc welder. Electric welders have replaced baling wire to hold machines together on many ranches. The welder is usually kept near the front door of the shop ready for the many small repairs as well as modifications that are needed on the less husky implements built for midwesterners. Some operations are big enough to justify portable welders for field use, but the implement can usually be brought to the shop.

A 180 ampere welder will do most of the work required. The power company will want to service it with a 5 KVA transformer on a 230 volt circuit.

Cutting is another problem. Many operations cannot justify an oxy-acetylene cutting outfit. The tank rental is usually the limiting factor. Hacksaws can still cut and should have alloy steel blades. A good chisel and heavy hammer can break many welded joints too hard to cut with a saw.

Jacks and hoists are used regularly in most farmshops. The capacities needed will be determined by the work to be done. A wrecker truck, a fork truck, or a winch on some other tool might do all the lifting needed. Some operators will not allow engine overhaul work to be done in the farmshop. The feeling

15

GOOD HOUSEKEEPING means "A place for everything and everything in its place." Bins for small parts save space and time.

is that more good can be accomplished on **preventive** maintenance. If a mechanic is allowed to do overhauls, then he passes up menial but important lubrication inspection and replacement chores.

Housekeeping in a farmshop is as important as anywhere on the ranch. "A place for everything and everything in its place," should be repeated every Monday morning to get the place straight and ready for use. A want list can be a help. A master plan for improvements is a healthy sign. Fire extinguishers, first aid kits, color coding, heat for cold days, light for needed night work—all are refinements to some, necessities for others. You can't overlook the fact that safety is first in saving or making money. Efficiency comes from work; it doesn't just happen. In any farmshop it means better tools, better skills—today and tomorrow.

16

EVERY SHOP should have a "clean corner"—a place reserved for paper work, a catalog file and a want-book, where needed items are noted for future purchase.

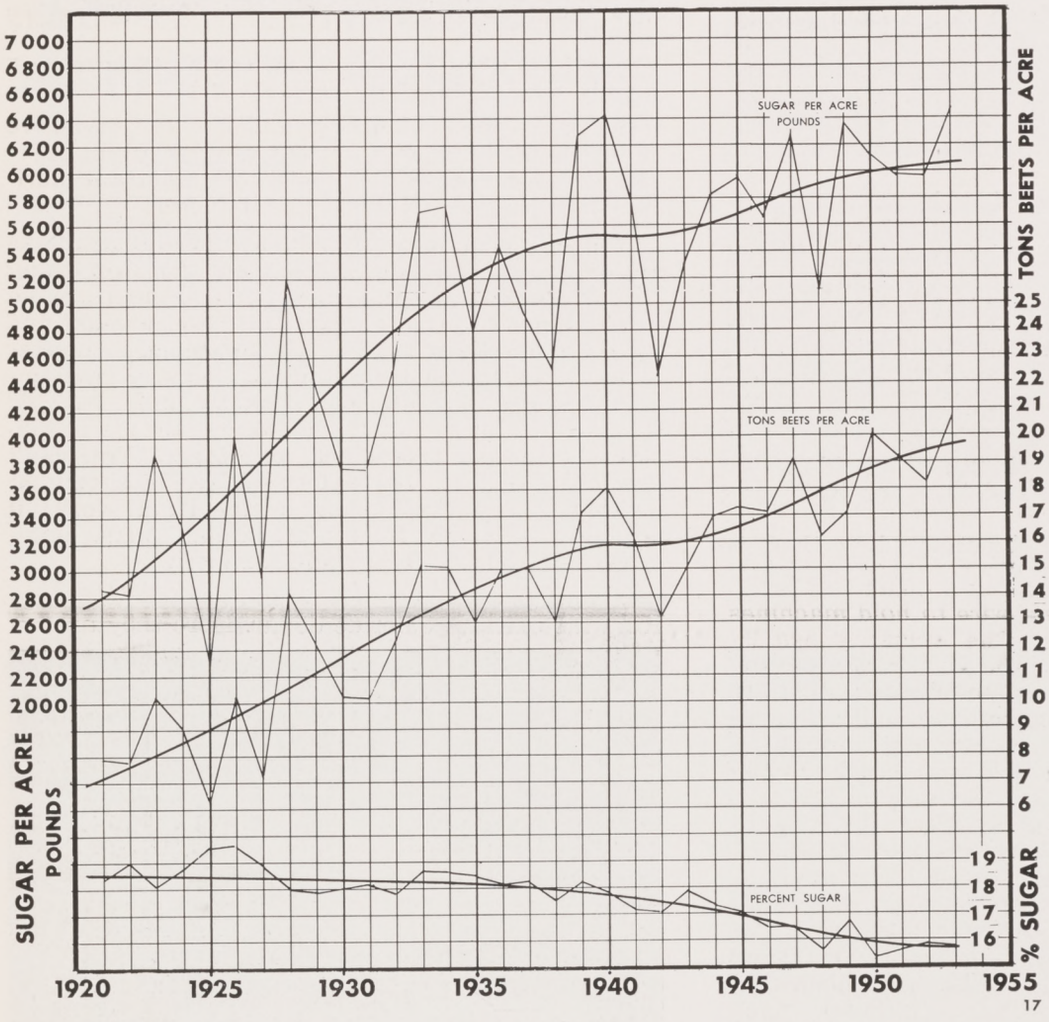
TRENDS IN SUGAR PRODUCTION

By DR. RUSSELL T. JOHNSON[1] and L. M. BURTCH[2]

OVER the past thirty years, records of the Spreckels Sugar Company have shown an upward trend in sugar per acre despite a downward trend in sugar percentage. This is the result of striking increases in beet tonnage—from 10.6 tons per acre in 1923 to 20.7 tons per acre in 1953. Since Spreckels growers are paid on the basis of pounds of sugar per acre, a comparison of sugar per acre is even more important than tonnage and sugar percentage. This comparison shows that our growers produced more sugar per acre in 1953 than in any previous year. The comparison with 1923 shows an increase in pounds of sugar per acre of 2592 pounds, or more than 67 per cent.

The exact physiological mechanism of how the sugar is manufactured in the leaves and stored in the roots is not known. Recent studies, however, have led to the determination of certain factors which have an effect on the storage of sugar in the beets. In general, it has been shown that as long as conditions of moisture, nutrients, and temperature are satisfactory for growth, the root continues to enlarge and not until some of these conditions become unfavorable for growth can the maximum sugar content in the root be achieved. Dr. Albert Ulrich, in some carefully controlled experiments at the California Institute of Technology, demonstrated that sugar percentages could be increased appreciably by letting the beets become deficient in nitrogen and lowering the night temperatures.

In the past thirty years great strides have been made in agricultural technology. In sugar beet agriculture, for example, these improvements have been reflected in the increased yields as cited above. While these improvements have been responsible for greatly increasing yields, some of them have also been responsible for a reduction in sugar percentage. With the increasing knowledge of the value of nitrogenous fertilizers, increasing amounts have been applied to the crops. This has been one of the most important reasons for the increased yields, but indications are that in some cases, the amounts of nitrogenous fertilizers applied are so high that the beets never become deficient prior to harvest and hence, may be responsible for a reduction in sugar percentages. Increased use of irrigation water until nearer to harvest has increased yields but may have decreased sugar percentages somewhat. The use of mechanical harvesters has also had an effect. When beets were hand topped and windrowed for later loading, often they were in the field exposed to the sun and the wind for a day or two before being loaded and delivered to a receiving station. During this time the beets became dehydrated



THESE CURVES show the sugar per acre, tons per acre, and sugar percentage for each year since 1921 (broken curve). The smooth curves are trends plotted from 5-year averages, and show strikingly the continuing upward trend in sugar per acre; the close correlation between sugar per acre and tons per acre; and the slight downward trend in sugar percentage which has not been significant in reducing sugar per acre.

[1]*Plant Breeder, Spreckels Sugar Company, Spreckels, Calif.*
[2]*Agronomist, Spreckels Sugar Company, Sacramento, Calif.*

(Continued on Page 16)

CALCIUM CHLORIDE—AN AID TO DUST CONTROL ON THE FARM

By CHEMICAL SALES STAFF
Dow Chemical Company

WE ALL KNOW from experience that dust can become a very serious nuisance to the western farmer, not only because of the discomfort it causes but also because dust costs money. When you add up the costs of dirty crops, inefficient labor, excessive wear on expensive equipment and loss of high-cost road material you arrive at a sizable number of dollars. The trouble is, there is no known way of controlling this nuisance without spending a considerable sum of money. Therefore, the decision that must be made by the western farmer is, how much, if anything, he can afford to spend to control dust.

There are many means of dust control available to the western farmer. These range from paving, down through oiling, to watering. The purpose of this article is to describe a chemical means that has proven very successful under midwestern conditions, and which can be used under western conditions if proper attention is paid to the limitations put upon it by our climate.

This chemical means is provided by calcium chloride, which is produced in two convenient forms: flake containing 77 to 80%, and pellet containing around 94% of pure anhydrous material. Calcium chloride is somewhat similar chemically to common salt and has about the same effect upon vegetation and equipment. However, it has the special property of absorbing water, which has led to its being called the "ever-thirsty chemical." It functions in two ways: it draws water from the air if there is sufficient humidity to provide this moisture, and it holds water in the road surface if this moisture has been provided by other means.

There are many parts of the state where there is sufficient humidity in the air so that a calcium chloride treated farm road will maintain a firm, dust-free surface with minimum attention over the entire summer season. In other areas a modest amount of watering must be done to prevent the surface from completely drying out and the chemical from blowing away with the resultant dust. However, wherever it is used, the cost and problem of watering is very much reduced. It is not possible to set down rules as to when you should water in relation to the humidity. Actually, it is not a question of the relative humidity but the actual amount of moisture in the air. Air at a high temperature contains more water at the same relative humidity than does air at a lower temperature. For this reason, calcium chloride sometimes works better at a high temperature and a relatively low humidity than it does at a lower temperature and a somewhat higher humidity. The best indicator of when a calcium chloride treated road needs water is when it starts to dust. When a calcium chloride treated road dries out, it is not just the dust that is blowing away but it is also the chemical for which you have paid good money.

The best results occur when the material is uniformly spread over the surface of the road to be treated. It can be easily spread by mechanical means available to the farmer. This can be done by either applying the dry form to a well watered surface or by dissolving the chemical in water and applying it in solution. If the dry form is used, the pellets, which are, incidentally, the most economical form in the West, are the easiest to handle. For an initial application use 1½ pounds of the flake form or 1¼ pounds of the pellet form per square yard of road surface to be treated. If the road is heavily used and much wear occurs, a supplemental treatment of ½ pound flakes or 2/5 pound pellets per square yard should be used.

A list of Do's and Don'ts for western users has been published by the Dow Chemical Company to assist the western lumbermen in the proper use of the pellet form, which is offered under Dow's tradename, Peladow. These Do's and Don'ts are also pertinent to the farmer if he is to get the best use from his calcium chloride dollar. Here they are:

Dow Chemical Co. Photos

"BEFORE AND AFTER" photographs of a dirt road treated with calcium chloride. Note how the treated surface has retained a fine, smooth texture, while the clay binder of the untreated road has blown away as dust, leaving loose gravel base which will soon ravel.

DO'S	DON'TS
1. Start out with a good road.	Don't except calcium chloride to make a good road out of a poor engineering job.
2. Apply to a well consolidated road.	Don't apply calcium chloride to deep dust, loose gravel or sand—it will ravel or be dusted away before it becomes effective.
3. Do apply the solid form if there is sufficient relative humidity to dissolve it quickly. This saves hauling water.	Don't expect it to do a job if the relative humidity is so low that the calcium chloride will remain in the solid form and ravel to the edges before it dissolves.
4. Apply Peladow solution to a damp scarified road followed by rolling or traffic binding.	Don't apply Peladow solution to well compacted dry roads where runoff loss will be high.
5. Do use common sense in the application of either Peladow or Peladow solution—put it on the road only where you want water.	Don't apply calcium chloride on high clay content grades that are slippery when wet. Calcium chloride will simply maintain the slippery condition longer.
6. Do water the roadway when it begins to get dry.	Don't allow the calcium chloride to dry out and blow away with the dust—you'll lose it all and have to start over from scratch.
7. Do use common sense in watering calcium chloride treated surfaces.	Don't water sections that are already damp—it will waste water and create a muddy condition.
8. Do inspect equipment using the treated roadways and take such protective measures as may be necessary.	Don't expect calcium chloride thrown up on equipment to stop holding moisture from the air—it will, and rust will result.

Although there seems to be a lot of detail and a lot of pitfalls in the use of calcium chloride on roads, its proper function depends on the common sense application of a material that depends upon drawing and holding moisture for its action. Its use will often save its cost in terms of reduced expense, both in equipment and labor of watering. However, don't give away your water wagon. Don't forget that if water is not in the air the chemical will not manufacture it. You will have to apply water or run the risk of losing your investment.

SPRECKELS AGRICULTURAL STAFF HOLDS ANNUAL MEETING

ALL MEMBERS of the Agricultural Department met in San Francisco, March 10-12, for concentrated technical discussions relating to the many subjects of sugar beet agriculture.

The meetings were conducted under the chairmanship of Hugh Melvin and George Wright, District Managers. The program took the form of semi-formal presentations, followed by lively discussion. So varied was the subject matter, that nearly every member of the staff presented a paper.

Strictly agronomic subjects included Petiole Analysis, Curly Top Problems, Cercospora Leaf Spot, Nematode and Downey Mildew.

General Agricultural subjects included Chemical Weed Control, Spring Mechanization, Fall Plantings, Variety Trials, Plant Breeding, Sugar Beet Field Machinery and Special Problems in the San Joaquin Valley.

Subjects relating to agriculture were Farm Labor, 4-H Sugar Beet Projects, the Water Problem, Agricultural Accounting, Legal Phases of Agriculture, Railroad Problems, Sales Department Functions, Public Speaking and Industrial Relations.

A general session with the Operating and Sales Departments brought out the many aspects of the Agricultural Staff's part in the overall picture of beet sugar manufacture.

These staff meetings are an annual event, and an important factor in acquainting field superintendents from far-flung districts with the problems encountered by other members of the staff. The effort contributes to a better understanding of grower problems and to improved service to growers by the Agricultural Department.

19

THE AGRICULTURAL STAFF hears District Manager G. P. Wright, introducing Sales Department speakers, William Ottey and Charlton Johnson.

TRENDS —

(Continued from Page 13)

due to moisture evaporation, decreasing in weight and consequently increasing in sugar percentage. At the present time, with the beets harvested mechanically, they are often sampled at a receiving station within a few minutes after coming out of the ground, thus realizing a higher weight but a lower sugar percentage. Another reason for increased yields has been the improvement in land preparation to the extent that better initial stands are obtained. Improved varieties have also contributed to higher yields.

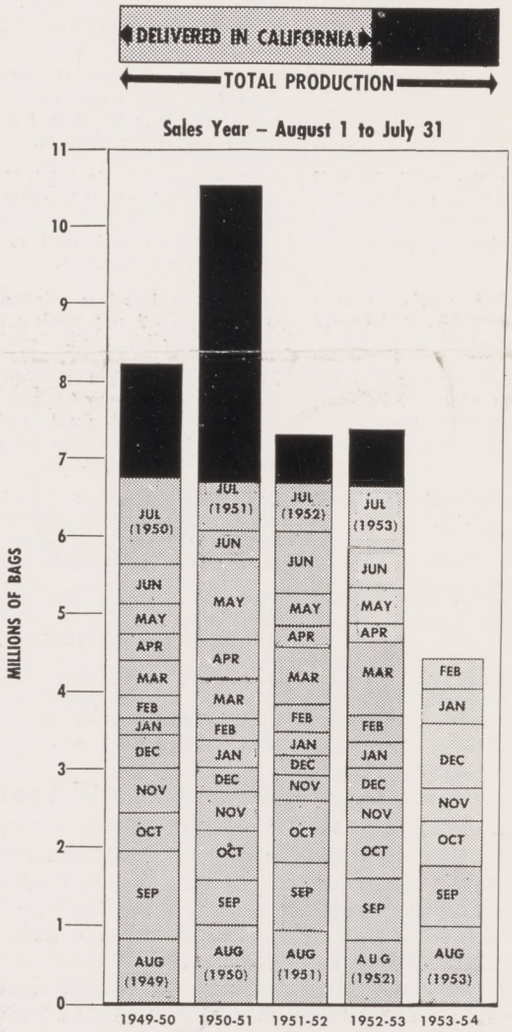
Of the above factors influencing yield and sugar percentages two are now being studied intensively in an effort to improve the sugar content. These are nitrogen fertilization and improved varieties.

The ideal situation with regard to nitrogen fertilization in a beet field would be to have adequate nitrogen available for best growth until a short time prior to harvest, at which time it should become deficient in nitrogen to allow the increase in sugar content. This problem is being studied by the analyses of the nitrate content of the petioles of beets to determine the best time at which a field should become deficient in relation to harvest.

The improvement of varieties in increasing sugar percentages has been attempted many times with many strains of beets. The usual method has been to sample large numbers of individual roots, then save for seed production only those with the highest sugar percentage. Sugar percentages of varieties can be increased in this manner. The trouble has been that increases obtained in this manner have usually been accompanied by decreases in root yield enough that the total sugar per acre has been reduced. By adaptation it has been easier to increase yields than it has sugar percentages, consequently the increases in sugar per acre that can be attributed to improved varieties are due to increases in yield rather than sugar percentages.

Within the last several years considerable interest has developed among sugar beet breeders in the possibility of producing hybrid sugar beets. In general, hybrids have been found to have a sugar content about equal to the average of the two parents which were crossed to produce the hybrid. The major advantage of the desirable hybrids seems to be their vigor and increased root yield. This condition might be of value, however, to produce beets with a somewhat higher sugar content. It seems possible that if two strains of sugar beets could be found that were both characteristically high in sugar content and would produce a high yielding hybrid when crossed, the hybrid should be satisfactory for yield and also have a sugar content higher than varieties in common use at present. The plant breeding program of Spreckels Sugar Company includes studies on the relationship of yields to sugar percentages in an effort to provide optimum varieties.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



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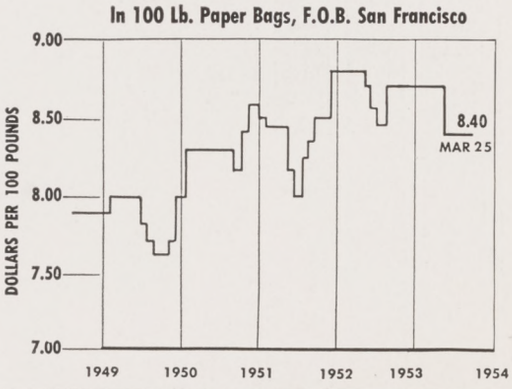

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AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

21

WHAT'S THE DIFFERENCE?

The beets on the left are hand thinned - Those on the right are machine thinned.
There is no difference in

AVERAGE STAND

CLUMPS

GAPS

A good job of machine thinning CAN be done.

Vol. 18 MAY - JUNE, 1954 No. 3

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

A GROWER'S OWN STORY OF COMPLETE MECHANICAL THINNING

Editor's Note: it was my privilege to have a good look at 41 acres of sugar beets thinned by Robert Farnsworth, a Spreckels grower at Grimes; and to get a first-hand account from Mr. Farnsworth on the full details of this successful venture in mechanical thinning.

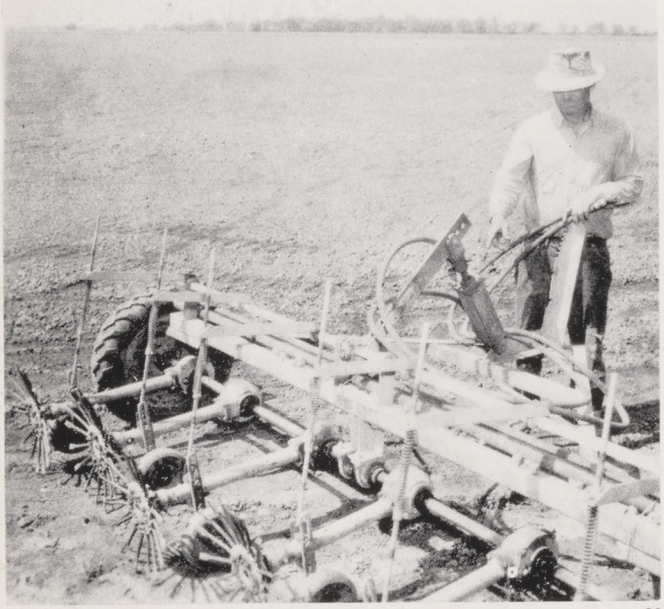
"WHY DID YOU decide to use mechanical thinning on 41 acres, Rob, when you knew there might be some sacrifice in quality and when thinning labor is generally available?", I asked.

Rob answered "You are wrong on both counts. Last January I saw that thinning labor might be hard to get—at least I didn't dare count on getting together as many men as I would need for my 150 acres. In the second place, now that I have thinned 41 acres by machine, I can't say that the results are the least bit worse than hand thinning.

"Furthermore, I have been reading a good deal about what other beet-growing states have done with mechanical thinning and I came to the conclusion that if a man did the best job he knew how with a thinning machine, the results should compare with hand work and there should be some saving in cost."

My next question: "How did you plan this mechanical thinning program—did you plant with the intention of mechanical thinning?"

"No, I didn't plant with the idea of thinning by machine—I wish I had. I am sure that if I had planted a little less seed, and if I had added some rollers along side the planter press wheel to smooth a path for the thinner gauge wheels, I could have done a better job. As it was, I planted about 7½ pounds of treated processed seed per acre with my John Deere #66. I planted to moisture, and the germination was pretty spotty. I made a hundred stand counts and these ranged from 12 to 46 beet-



22

HYDRAULIC LIFT and 50 pound weights on each cutter shaft housing (not shown) were the only alterations to the standard Silver Thinner.

23

SINGLE PLANTS were in the majority—the second pass of the thinner split most of the clumps.

containing inches per 100 inches of row. The average seedling stand was only 26%, but the table supplied with the Silver Thinning Machine showed how to set up the cutter to have 120 beets per 100 feet of row, final stand, and that is what I aimed at.

"My hat is off to the people who worked out the tables for that Silver Thinner. I have made any number of stand counts since thinning. These ranged from 90 to 140 beets per 100 feet, averaging 120 right on the nose, just as the tables predicted."

I asked Rob what cutters he used, and what sequence of operations.

"I went over once with the 1½"-8 spoke cutters, and the second time with ½"-16 spoke cutters, driving in the opposite direction the second time.

"My ground is pretty hard and I had to put 50 pound weights on each of the cutter drive shafts to be sure the cutters would go into the ground and not bounce."

I asked Rob if he had used any special procedure other than recommended in the manufacturer's literature.

"All I did to the Silver Thinner was add the weights to the cutters, and I installed a hydraulic lift. I thought I was going to have to raise and lower the cutters for every change in stand. But this is out of the question. I had a few low spots in the field with a very thin stand and I had to raise the cutters for those spots. Otherwise, I just had to grit my teeth and take my chances, going through thick and thin parts of the stand and hope for the average to pay out."

I noticed an almost complete absence of weeds and asked Rob what he had done about weed control.

"I'm pretty proud of that weed situation. I haven't done a thing to control weeds since planting, except one cultivation after thinning. But I have done

THE COVER—Robert Farnsworth stands on the boundary between hand-thinned (left) and machine thinned (right) beets. The cover photograph was doctored — the dark ground on the left is only a darkroom trick.

24

everything possible over the last many years to keep weeds off my ranch. There are more weeds than you think—I will have to hoe twice by hand."

I asked Rob if he would use the first hoeing as a means of trimming up the machine-thinned stand.

"No," he answered, "I am going to leave that machine-thinned stand just as it is. It has 120 beets in 100 feet of row, and there aren't enough doubles to bother with."

"Have you kept track of your cost on hand and machine thinning," I asked.

"Yes, I have, and I think I have saved about $5.00 per acre by using the thinning machine, twice over."

"That isn't much of a saving," I ventured.

"No it isn't, but you can't drive a tractor over a field for nothing. I figure it costs $3.00 an acre for each pass of the thinner.

"On the other hand, I have been getting my hand labor for $11.00 an acre, contract rate, for thinning —when I could get any men."

"What are your future plans for mechanical thinning," I asked.

"I will probably figure on complete machine thinning for half my acreage, and will probably go over all of the acreage one time so as to make the job easier for my hand crew, and to help destroy weeds.

"I don't want to get rid of all our labor on the ranch. I have got to have a hoeing crew and irrigators. What I intend to do is to eliminate the labor peak at thinning time so that I can keep a small crew on the ranch pretty much throughout the year."

Summarizing my notes after this altogether satisfying interview, I find these outstanding figures for Rob Farnsworth's operation:

Acres Thinned by Machine—41.

Method—Twice over with Silver Thinner.

Setup—1½"-8 spoke, then ½"-16 spoke.

Prethinning stand—12% to 46%-average; 26%.

Post-thinning stand—90 to 140 . . . average; 120.

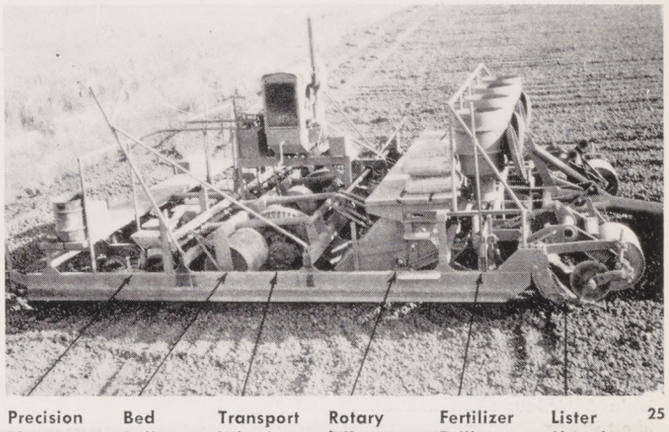
Cost—$6.00 per acre.

NEW MACHINE IN THE BEET FIELDS

THE RESOURCEFULNESS of sugar beet growers seems to be endless. Hardly a month passes without some new device being developed for the beet field, or an old device adapted to sugar beets.

Heidrick Brothers of Woodland have a reputation for building outstanding machinery of their own design, and the pictured sugar beet planting combine upholds this reputation. Planting combines (sled-mounted machines which list, fertilize, rotary-till, roll and plant) are in fairly general use in the Woodland area. About six of these machines have been built by Spreckels growers, all of which have been four-row machines. In contrast, the Heidrick brothers machine performs all of these operations on eight rows.

The Heidrick machine is truly designed for large-scale operations. At 2½ miles an hour, it covers four acres per hour—listing up beds, applying commercial fertilizer, rotary tilling, rolling and precision planting. To insure continuous and uninterrupted operations, Heidrick Brothers have installed cat walks and platforms so that the operator can keep seed and fertilizer hoppers full at all times while the machine is in motion.



Precision Planters | Bed Rollers | Transport Wheels | Rotary Tillers | Fertilizer Drills | Lister Shovels 25

CONTINUOUS OPERATION of the planting combine is achieved by filling fertilizer and seed hoppers while the machine is moving. 26

The Honor Roll For 1953

GROWER	ACRES HARVESTED	TONS PER ACRE	POUNDS SUGAR PER ACRE
Bruce Church, Inc.	36.0	45.09	11,573
Mary F. & E. E. Nutting	17.0	44.21	13,412
Raymond Martin	39.0	43.31	12,716
Anthony Machado	76.0	42.51	11,826
Lazo & Deo Campo	13.6	39.75	13,080
W. & J. Silva	6.0	39.49	11,878
Ray T. Thorne	9.3	39.35	12,353
Resetar Produce Co.	28.6	39.00	12,421
Ralph Burson	20.0	38.92	11,738
Paul Hanson	65.0	37.96	8,029
Thomas B. Porter	10.0	36.73	11,679
Tony O. Tomasello	6.0	36.13	9,957
Martella Bros.	36.2	36.08	10,276
Anthony Silva	70.0	36.01	11,445
Matteucci Bros.	11.0	35.63	12,112
F. S. Travers	26.8	35.38	11,907
H. Allemand	25.0	35.38	10,424
Bruce Church, Inc.	25.0	35.30	11,393
Pete Pedevilla	23.8	35.25	11,212
Gene Kane Co.	27.0	35.23	12,170
George M. Petersen	28.0	34.80	9,925
Garnet W. Herbert	64.0	34.76	11,254
K. Kamimoto	15.0	34.50	10,858
Malcolm Farms	109.0	34.26	11,347
Farley Fruit Co.	30.1	34.20	10,594
A. Radavero	9.0	34.10	10,773
Manuel Fialho	55.0	34.06	10,109
Nick Albanese	2.5	33.97	9,289
R. Marci	11.3	33.95	10,714
Louis P. Battinich	15.0	33.89	10,492
William D. Crinklaw	72.0	33.75	10,147
Lazo & Deo Campo	13.0	33.55	11,155
Ernest A. Ricotti	11.0	33.38	11,524
H. Allemand	42.0	33.32	9,823
E. Bassetti	20.0	33.31	10,474
Alvin Noll	30.0	33.16	11,130
Peter & Arnold Breschini	18.6	33.03	9,694
Tony Castanho	24.0	33.00	10,758
Sears Bros. & Co.	26.0	32.95	11,340
Triple J Farms	130.0	32.93	10,116
Li Bru Farms & E. J. Russell	53.0	32.82	9,113
Tognetti Bros.	26.8	32.76	9,813
Watsonville Exchange, Inc.	41.0	32.73	11,515
Walter Migotti & Son	31.2	32.56	10,698
Joe Escobar, Jr.	35.0	32.55	9,784
Corda & McDougall	42.0	32.54	11,393
Albert Rohde	28.5	32.51	10,342
Antonio F. Silveira	70.5	32.47	11,065
Edward A. Johnsen	22.8	32.39	9,290
Frick Bros.	120.0	32.35	9,957
Tognetti Bros.	34.4	32.31	9,676
E. J. Evans	10.0	32.30	9,981
Porter Land Co.	45.0	32.15	9,253
John & Bob Corda, Jr.	13.0	32.06	10,237
Tognetti & Fillippelli	80.0	31.78	10,205
Schween Bros.	31.8	31.70	9,331
Franscioni, Griva & Son	40.2	31.63	9,901
M. G. Da Rosa	40.0	31.61	8,610
E. H. Abeloe	28.0	31.54	10,767
Paul Hanson	36.0	31.52	9,645
James Widmer	55.0	31.51	9,900
Phillips Wyman, Jr.	27.2	31.51	10,091
Lester Stirling	18.8	31.51	9,753
Schween Bros.	30.6	31.41	9,911
Gomes Bros.	19.0	31.36	10,116
John S. & Leo Tamagni	29.3	31.28	9,991
Paul Hanson	61.0	31.24	9,766
E. H. Spiegl	40.0	31.19	9,085
J. P. Adams & Son	20.1	31.17	10,401
Joe Jacinto	7.0	31.12	9,812
Foster Hutchings	8.0	31.06	10,751
Merrill Farms	23.9	30.99	9,661
Joe Escobar, Sr.	65.0	30.92	11,702
Enos N. Silva	15.0	30.90	9,006
Arthur S. Nyland	40.0	30.87	10,374
Oliver C. Bardin	30.0	30.77	10,577
John E. Nissen	44.8	30.72	9,874
Jacop Bros.	17.7	30.72	9,860
Newhall Land & Farming Co.	39.0	30.70	9,314
Tavares Bros.	15.0	30.63	10,391
Victor Schiaffini	7.0	30.62	8,996
W. B. Grainger Packing Co.	48.8	30.62	9,700
Albert J. Perry	80.0	30.58	8,935
Jim Fanoe	114.5	30.56	9,849
Kiyoi Bros.	35.0	30.51	10,209
Tony Homen, Jr.	16.5	30.47	10,054
Gene G. Ferraro	16.0	30.44	11,141
Peter Lesnini	31.2	30.35	8,892
Gibson Bros.	6.0	30.30	10,880
Raymond Martin	15.0	30.30	7,554
Gibson Bros.	18.0	30.28	9,897
Clark & Romans	51.3	30.26	9,158
Joe P. Gambetta	45.0	30.22	10,119
G. P. Sgheiza	35.0	30.19	12,290
Ira E. Hudson & Son	125.6	30.18	9,283
Tom Storm	21.0	29.96	9,885
Newhall Land & Farming Co.	136.0	29.95	8,979
Newhall Land & Farming Co.	62.0	29.87	9,224
Forden Farms	32.3	29.84	9,235
Jim Fanoe	22.0	29.82	10,034
Tony O. Tomasello	90.0	29.82	8,996
Melvin Baumbach	80.0	29.80	8,839
The Garin Company	25.7	29.77	9,775
Chas. Gianolini	41.0	29.71	9,367
Tony Tomasello	10.0	29.66	9,878
O. L. Petersen	24.2	29.61	8,939
Fred & Martin Ramseier	60.0	29.60	8,923
A. Frew	70.3	29.46	9,862
Tony Castanho	40.0	29.40	9,761
Harry & Joe Young	45.0	29.39	9,648
Fabretti & Dedini	40.6	29.36	8,916
Botelho Bros.	38.0	29.32	10,028
L. & A. Salmina	30.5	29.27	9,646
Joe Gerber	14.5	29.19	9,320
Bassi Bros.	20.3	29.18	9,370
Taix Company	18.0	29.17	9,904
Art Manzoni	10.0	29.11	8,078
Lanini Bros.	10.3	29.05	9,923
Richard E. Mahon	140.0	29.04	9,113
Thomas B. Porter	77.6	28.97	9,317
Y. Aoki	150.0	28.96	8,114
Dan G. Best	158.0	28.96	7,547
Erle E. Santens	20.0	28.96	9,065
J. P. Braycovich Co.	29.5	28.91	9,550
Peter & Arnold Breschini	6.5	28.87	8,120
Newhall Land & Farming Co.	51.0	28.87	9,319
Rudy Howald	20.0	28.85	7,951
Hanson & Barkley	54.0	28.83	8,782
Ervin Robasciotti	10.0	28.78	8,347
Ishida Bros.	30.0	28.66	9,658
Walter Jefferson & Son	26.7	28.62	9,212
Wm. A. McDonald	130.0	28.62	9,708
San Juan Ranch	60.0	28.59	9,317
Alfred Riva	13.0	28.49	8,327
George Boutonnet	25.6	28.42	9,899
Hitchcock Bros.	51.7	28.42	9,328
Turri Bros.	88.2	28.41	9,467
Phillips Wyman, Jr.	15.3	28.35	8,256
K. Shimizu	117.0	28.29	7,616
Connell & Reed	32.5	28.28	8,974
Tsuji & Inouye	47.0	28.28	7,947
Newhall Land & Farming Co.	32.0	28.26	8,738
Drew Farms, Inc.	120.0	28.24	8,811
Anna Garsino	5.0	28.17	8,147
M. S. Furtado & Son	11.5	28.12	9,396
Lindeleaf Bros.	25.0	28.11	9,625
Joseph Valenti	32.0	28.11	8,287
Richard Moore	115.0	28.10	8,284
Shafer & Loudon	52.0	28.09	7,472
Frassetti Bros.	20.0	28.08	9,414

These are the growers whose 1953 yields were 25 tons per acre or more. They have set three new records—more contracts over 25 tons per acre; over 35 tons per acre, and over 30 tons per acre — than on any previous Honor Roll. Sincerest congratulations from Spreckels Sugar Company.

GROWER	ACRES HARVESTED	TONS PER ACRE	POUNDS SUGAR PER ACRE
C. Parella	51.0	28.07	8,808
Massa Bros.	23.2	28.05	8,559
Usrey & Taylor	113.5	28.02	9,250
Obata Bros.	106.0	28.01	8,578
Farley Fruit Co.	30.2	28.00	10,047
M. Barandas	73.0	27.98	8,809
Frew Bros.	77.7	27.97	9,399
The Garin Co.	10.4	27.97	8,401
A. B. Silva	24.5	27.95	9,566
Glen A. Moody	56.0	27.94	8,779
Merrill Farms	120.9	27.91	8,557
Donald Fong	36.0	27.88	8,855
Joe Sabbatini	56.0	27.83	9,245
Massa Bros.	21.0	27.78	8,820
Anthony Vosti	16.5	27.77	8,990
Joseph Valenti	62.0	27.76	6,851
Bruce Church, Inc.	31.3	27.75	7,788
Jang Bros.	66.0	27.74	8,017
P. M. Resetar Co.	18.5	27.74	9,102
Joe F. Rosa	45.0	27.70	7,595
Dean E. Pryor	20.0	27.61	8,953
Q. L. Gerhart & Son	45.0	27.58	9,123
Phillips Wyman, Jr.	40.0	27.53	8,226
Newhall Land & Farming Co.	34.0	27.52	8,966
Otto Burgdorf	25.0	27.44	7,804
California Packing Corp.	60.0	27.44	8,210
P. Freggiaro	32.0	27.44	8,095
J. H. Braden	38.0	27.42	8,226
T. S. & Tom Hudson, Jr.	23.3	27.42	8,870
W. & S. Packing Co.	30.6	27.42	7,623
Paul Wm. Bertuccio	14.0	27.31	9,288
R. G. Wood	8.7	27.28	8,408
Schween Bros	31.5	27.24	8,544
Henry Bondesen	25.0	27.11	8,952
Joe F. Filice	40.0	27.07	9,587
R. F. Malcolm, Jr.	115.0	27.07	7,753
Henry Rehrman	122.0	27.01	8,114
Jesse G. Homen	18.5	26.94	8,661
Church & Hughes	22.3	26.87	8,183
Fred J. Banducci	75.0	26.84	7,461
Sgheiza Bros.	45.0	26.84	9,159
E. J. Evans	27.0	26.83	7,582
F. A. Yearout & Co.	110.0	26.80	7,611
Patane & Garcia	8.0	26.79	8,484
F. J. Krehe	41.0	26.74	7,567
Julio B. Nunes	56.6	26.73	9,177
M. Neilson & Son	45.0	26.72	6,279
John M. Dinsdale	36.0	26.70	7,973
Ritz Distributing Co.	155.0	26.70	8,491
Glen Wimer	43.5	26.70	8,411
Ira E. Hudson & Son	285.0	26.68	8,685
Pasque & Franscioni	23.9	26.68	8,167
Locke Ranch	78.0	26.67	8,140
Howard Bros.	28.0	26.64	7,496
Newhall Land & Farm Co.	43.0	26.62	8,188
Alfred Riva	32.9	26.61	8,037
C. & A. Mortensen	26.0	26.59	9,175
W. & S. Packing Co.	48.0	26.59	7,460
Frank Accito	36.0	26.56	6,337
Ice Kist Packing Co.	173.8	26.56	8,031
J. Orregia & Co.	61.0	26.53	8,908
J. H. Riley	52.5	26.52	9,314
Fred Rehrman	104.0	26.52	9,102
Scaroni Bros.	31.0	26.52	8,381
Vanoli & Bravo	43.7	26.52	8,268
C. L. & A. W. Johnson	50.6	26.51	8,886
R. Sargenti & Son	15.3	26.50	8,399
Don A. Davis	39.0	26.48	8,723
K. Kamimoto	40.0	26.41	8,744
Albert C. Hansen & Son	157.7	26.36	8,486
Newhall Land & Farming Co.	36.0	26.34	8,297
Thomas R. Mabalet	32.0	26.34	8,940
E. N. & W. F. Winters	39.0	26.27	7,923
Talmadge Ranch	72.0	26.24	8,161
Texara & Machado	80.0	26.24	8,486
T. Harney & Co.	56.0	26.21	8,192
Arthur Oji	133.0	26.19	6,595
Paul W. Reiff	40.0	26.19	7,768
John Silveira & Sons	31.5	26.18	7,972
C. A. Kelly & Son	55.0	26.17	8,318
A. S. Duarte	54.0	26.09	8,231
Arcotti Bros.	14.2	26.08	8,270
Joseph H. Longeval	40.0	26.08	6,979
Hammonds Ranch, Inc.	185.0	26.07	7,894
John G. Nunes, Jr.	38.0	26.03	9,002
Frank Alvernaz	51.0	26.01	8,307
B. L. Parsons	54.0	26.00	7,982
Tony Castanho	22.0	25.97	8,295
Joe Garsino	55.0	25.97	8,139
Erle Warnken	40.0	25.97	7,874
John W. Mahon, Jr.	115.0	25.96	8,273
Clifford R. Bissett	20.0	25.95	8,273
Jack & Manuel Bastiao	75.0	25.93	8,157
E. M. Olson	100.0	25.93	7,934
Roland F. Oliveira	48.0	25.91	7,814
Aldo Navone	15.0	25.90	7,640
Wetzel Bros.	60.0	25.90	7,247
Barnard Bros.	40.0	25.89	7,886
Dora, James & Carl Rianda	29.0	25.87	7,238
Peter Charich	30.0	25.84	8,021
M. Martinez	27.0	25.84	7,700
Shigaki Bros.	177.0	25.83	7,594
Joe Cunha	50.0	25.81	9,323
Paul Hanson	94.0	25.78	8,420
Michael Enos	59.0	25.78	8,853
Ice Kist Packing Company	59.7	25.73	7,506
Juan Ramirez	34.0	25.70	8,070
Joe Rosa	45.0	25.68	7,041
Parks Bros.	100.0	25.67	7,259
Mary F. & E. E. Nutting	45.0	25.64	8,447
Frank Alvernaz	51.0	25.62	8,183
Griva Franscioni & Son	16.0	25.60	8,538
J. Venturini	45.0	25.60	8,376
King & Soares	49.0	25.58	8,311
River Maid Farms	128.0	25.51	7,908
Newhall Land & Farming Co.	62.0	25.49	8,210
Angelo Corda	24.0	25.49	9,465
E. J. Hart	89.5	25.43	8,047
Frank Alvernaz	48.0	25.41	7,643
Hammonds Ranch	70.0	25.40	7,879
Tony Ferreira	92.0	25.39	7,805
J. Edmund Culver	96.0	25.36	7,790
O. L. Petersen	9.8	25.36	6,675
Harold & Elena Christensen	72.5	25.35	8,165
Fanoe Bros. & Sons	186.8	25.33	8,621
University of California	5.0	25.32	6,730
United Farms Co.	60.0	25.31	8,267
Rosalind G. Christie	39.0	25.30	8,308
Lloyd M. Eveland	110.0	25.30	6,522
Newhall Land & Farming Co.	53.0	25.28	7,629
Robt. D. Evans	65.0	25.23	7,090
Melvin A. Baumbach	25.0	25.21	9,126
Ralph C. Harrington	121.4	25.20	8,311
Ning Young & J. E. Ayer	30.0	25.19	8,403
Mitchell Resetar, Jr.	36.0	25.18	7,701
Bruce Church, Inc.	39.0	25.18	7,182
Grant & Wilson	40.0	25.17	8,029
Romoni Bros.	154.0	25.17	8,553
Albert Bevis	35.0	25.15	7,040
Newhall Land & Farming Co.	53.0	25.15	7,580
J. R. Isaac	35.0	25.13	6,127
Mrs. B. J. Marks	141.3	25.12	8,134
Bennie S. Black	32.2	25.09	8,744
Mr. & Mrs. C. H. Ferrasci & Son	29.2	25.07	8,709
Campi Bros.	50.0	25.06	7,518
Giovacchini Bros.	15.0	25.05	7,129
C. M. Ordonez	25.0	25.03	8,490
George M. Struve	460.0	25.02	8,672
James N. Fulmor	115.0	25.01	8,133
Hugh Bennett	215.0	25.00	7,835

JUNIOR CATTLE RAISERS CLAIM AWARDS AT COW PALACE

By JOHN M. KENDRICK
Assistant to General Agriculturist
Spreckels Sugar Company

SPRECKELS SUGAR COMPANY is again participating in the San Francisco Junior Chamber of Commerce livestock merit award program. In this program over 30 business firms make cash donations to a like number of worthy 4-H and F.F.A. youngsters toward the purchase of a feeder calf. These awards are made annually at the Grand National Junior Livestock Exposition held at the Cow Palace in San Francisco during Easter vacation week. The young people, who are recipients of these donations, fatten the animal and return to the Cow Palace the following year to show the fed animals in competition with each other. The animals are judged on the Danish system, which classifies fat stock as prime, choice, good or commercial. There are very few youngsters whose animals will fall in the latter two categories, which is certain evidence of the enthusiasm and care exercised by the award winners in carrying out their projects.

Last year Miss Janice Brittsan, in the Waverly 4-H Club of San Joaquin County, was the recipient of the Spreckels award. This year she accompanied her steer to the Cow Palace, where on April 12th it was graded "choice" on the hoof. The steer weighed in at 935 lbs. alive, and when slaughtered and dressed, hung up at 568 pounds for a carcass yield of 60.7 per cent. The carcass, like the live animal, graded choice.

The award winner this year is Thomas Mills Watson of Sacramento, a member of the Elk Grove F.F.A. Chapter. Tom expects to purchase his steer before long, as he is anxious to get started. The company will follow the progress of both Tom and his calf with interest until show time in 1955.

27

JANICE BRITTSAN is congratulated by Spreckels Vice President Guy D. Manuel.

THOMAS MILLS WATSON, Sacramento Future Farmer, receives the 1954 Calf Award from John Kendrick of Spreckels Agricultural Department.

28

ELECTRICAL SAFETY ON THE FARM

By G. E. HERSAM
Pacific Gas and Electric Company

ELECTRICITY is perfectly safe—for those who make it safe. We would like to present some hints that can help save your farm from fire and might even save a life.

CHECK YOUR WIRING

First, begin with the fuses. Are they of the proper size? Are any of them coppered; i.e., a penny or metal disc used instead of a fuse? If the wiring is number 14 wire, the fuse should not be over 15 amperes; for No. 12 wire, no larger than 20 amperes. Remember that the larger the wire size number, the smaller the wire. If the equipment being used has provision for three fuses and is used on a 120/240 volt single phase circuit, under no condition should the ground wire or neutral be fused.

If you do your own wiring (and what farmer doesn't make a few changes in his wiring to suit himself) be certain that at each building there is an entrance switch with fuses. If children are in the area, the switch should be placed out of their reach. Flexible cord should not be used as a substitute for fixed wiring. It should not be run through holes in walls, ceilings or floors. Neither should it be installed behind building walls, ceilings and floors. Any wiring you do should comply with the Electrical Safety Code. The entire wiring code is based on safety; it specifies only the minimum requirements that can be used with safety. If you don't fully understand electrical safety, see your electrical contractor. The contractor will install the equipment in a safe manner.

Grounding of electrical equipment should be a "must"; when a piece of equipment is properly grounded, it may be touched with no more danger than your kitchen faucet. Grounding is nothing more than connecting the piece of equipment to the earth;

usually the water pipe is used. If plastic pipe is used in the water system, it is well to use a driven ground. This should be a metal rod and it should be driven into the earth to a depth of 7 or 8 feet. All metal conduit should be grounded, and the installation so designed that the ground is continuous throughout the entire system.

CHECK YOUR EQUIPMENT

Portable tools, such as drills and hand circular saws, should have the frame grounded. This can be accomplished by use of a three wire cord with one wire connected to the frame and the other connected to a ground. All stationary electric equipment should have the frame grounded.

Ordinary voltages used for shop lighting and operation of electrical hand tools can be fatal: A current of only one-tenth of an ampere, and sometimes less, will kill! Make sure your electrical hand tools are positively grounded. Remember—if you use an ungrounded electrical hand tool, and the frame becomes charged, the current may flow through your hand, arm, body and feet, to whatever grounded surface you are touching. Such grounded surfaces include earth, concrete or brick floor and walls, radiators, water and gas pipes and other metal surfaces. Here are a few of the things that can cause current to charge the frame of the hand tool used:

(1) Water in the trigger switch.
(2) Carbon from the motor brushes.
(3) Broken or loose parts within the case of the motor or trigger switch.
(4) Defective insulation of the motor windings.
(5) Loose cord connection in the tool or attachment plug.
(6) Worn or defective portable cord or cord connections.

If the tool is defective or does not operate properly, take it to a qualified electrician for adjustment or repair—It Could Save Your Life.

Do not use equipment intended for indoor use out of doors. When you purchase a piece of electrical equipment, make certain it has U.L. Approval (U.L. —Underwriters Laboratory). This is for your protection. If any electrical device is to be operated in a dusty location (hay dust, dust from wheat or other grains) the electrical switches or arcing or sparking pieces of equipment should be located outside of such areas or explosion proof components installed.

BEWARE OF HIGH VOLTAGE

Be careful when working near "High Voltage" lines (anything over 220 volts). Never let any piece of equipment come closer than 6 feet of any high voltage line. High voltage lines over orchards may create a serious farm electrical hazard. Aluminum poles used to knock walnuts have been the cause of three men being injured, one of whom died within a period of one year. Well drilling and the pulling of pump equipment has injured and killed many people. Spray rigs and loading equipment should be kept away from high voltage lines. Always remember the rule—keep at least 6 feet away from high voltage lines. Sprinkler systems where aluminum pipe is used is a hazard. Men carrying sections of pipe have had the pipe come in contact with

(Continued on next page)

SPRING MECHANIZATION FIELD DAY AT HOLLISTER

DISTRICT 7 of the California Beet Growers Association staged a field demonstration on the Ted Holthouse Ranch near Hollister on Tuesday afternoon, April 13. Over 200 growers, sugar company officials and machinery dealers attended the very comprehensive demonstration of the work accomplished by a variety of precision planters, mechanical thinners and rotary cultivators.

Credit is due the Extension Division of the University for their work in planning the field experiments, and for the work yet to be done in harvesting the plots for evaluating the performance of the different machines.

Special mention goes to Ted Holthouse who not only permitted his beet field to be mutilated by a milling crowd of onlookers, but who also designed one of the thinning machines which was demonstrated.

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3

29

1. — Roy McCallum, San Benito County Farm Advisor, officiated at the demonstrations.
2. — The Holthouse blocking machine was the attraction for these onlookers.
3. — Bob Wood, CBGA District 7 President, greeted the more than 200 guests.

ELECTRICAL SAFETY

(Continued from preceding page)

power lines. TV antennas are a potential hazard. Many antennas are higher than the power lines, and during installation or by storm action have fallen over high voltage lines. During 1953, in California, 13 people have been involved with TV antennas and power lines—7 injured and 4 killed.

If, on your ranch. you must move equipment under power lines, you should first make an inspection of the route of travel. Determine accurately the location and heights of all high voltage lines. If these lines might prove a hazard during the operation, make arrangements with the power company, well in advance, ho have the lines de-energized, raised or rerouted.

Do not attempt to move or raise electric wires, for any reason. Don't take a chance. If you're in doubt, call the power company.

If your youngster flies a kite, make certain he has been instructed in these basic rules:

(1) Never fly a kite near any electric wires.
(2) Never climb a pole to untangle a kite.
(3) Never build or fly a kite with metal or wire in the frame or tail.
(4) Never use tinsel string, wire or any kind of twine that has a metallic substance. Use plain cotton cord.
(5) Never touch fallen electric wires.

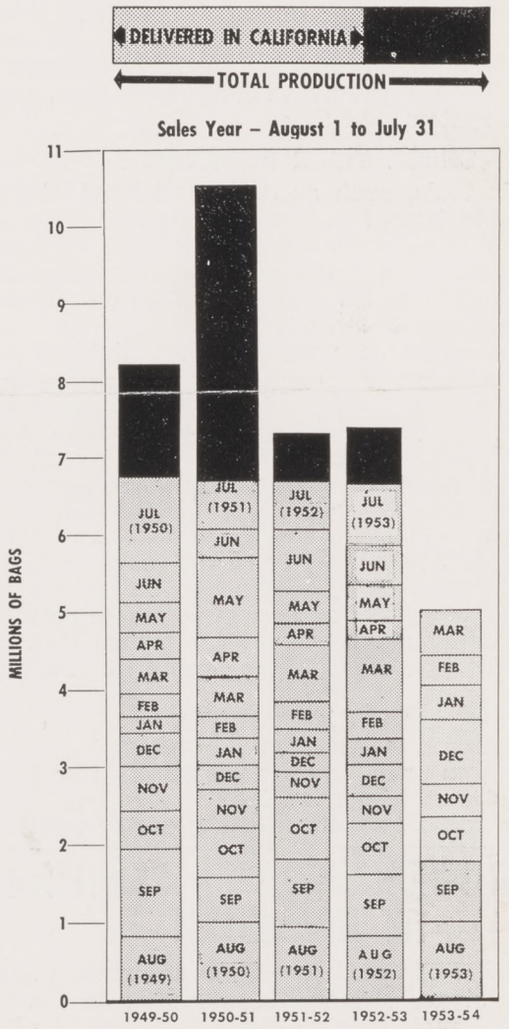
Kites can be fun if you fly them safely!

Pump motors of 50 HP and over should have the main switch plainly marked "Do Not Open Under Load." Any single throw knife switch shall be so placed that gravity will not tend to close the switch. The switch should be so connected that the blade is dead when the switch is in the open position.

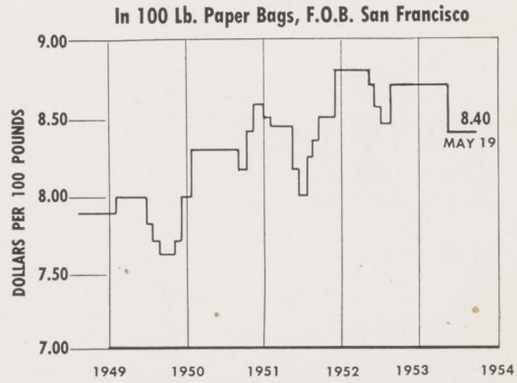
Here are a few of the basic rules of electrical safety. Remember them.

(1) Don't over fuse.
(2) Wire in accordance with the Electrical Safety Code.
(3) Portable tools must be grounded.
(4) Never let children fly kites near power poles.
(5) Never attempt to move or raise high voltage electric wires.
(6) Never operate any equipment closer than 6 feet from a power line.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR



The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento 14, California

SPRECKELS SUGAR BEET BULLETIN

31

THESE MEN WORK FOR YOU

They are three of the scientists at work in the new University of California Department of Nematology.

U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY EXPERIMENT STATIONS
SUGAR BEET PROCESSORS

have joined forces in the fight against agriculture's age-old enemy — nematodes.
See Page 26.

Vol. 18 JULY - AUGUST, 1954 No. 4
PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

UNIVERSITY ESTABLISHES DEPARTMENT OF NEMATOLOGY

PLANT NEMATODES, sometimes termed "the problem of an aging agriculture," will be the province of a new state-wide department of the University of California.

Under chairmanship of Dewey J. Raski on the Davis campus, the Department of Plant Nematology will coordinate and intensify research work on the microscopic, soil-dwelling round worms that inflict heavy losses on agriculture each year.

Establishment of the department was announced in late June by Harry R. Wellman, vice-president, agricultural sciences. He said Merlin W. Allen has been designated vice-chairman of the new department on the Berkeley campus and Richard C. Baines as vice-chairman at the Citrus Experiment Station, Riverside.

Many research projects, including extensive work on sugar beet nematodes, will be state-wide, with complementary work involving all three campuses.

New greenhouses and headhouses for plant nematology research at both Davis and Riverside soon will be under construction. They are being built and equipped under a special appropriation of $150,000 voted by the state legislature last year.

Out of suspicion that more and more crop difficulties in California can be traced to nematodes came the need for a full-scale research department in that field, explained Dean Fred N. Briggs of the College of Agriculture at Davis.

OTHER DEPARTMENTS COOPERATE

Plant nematode research at Davis, as well as on the other campuses, Briggs said, will involve assistance and cooperation from all other departments interested in nematodes. Plant pathologists, interested in all plant diseases, and the production departments such as agronomy, vegetable crops, pomology, and viticulture, which are breeding plants for resistance to nematodes, will be concerned in the broad nematode research program.

Outlining plans for his department, Chairman Raski noted that intensive study in the past has shown the main problems concern five major groups of nematodes: root lesion nematodes, root knot nematodes, the citrus nematode, the sugar beet nematode and others of the cyst-forming type, and the stem-and-bulb nematode. Some of these groups include several species.

"Our work with these widely-known groups," said Raski, "will include study of the range of host plants, of the number of crops damaged by any one species, and of the complex relationships of nematodes and other organisms such as the fungi and bacteria.

"We hope to learn what weeds serve as hosts to carry over some types of nematodes for the next susceptible crop. For some types of nematodes very little is known of the interim weed hosts.

"We shall try to learn something about the pathogenicity of nematodes, the numbers of them that must be present to damage or affect growth of a plant. We hope to learn more about the relationships of nematodes to resistant and tolerant plants, some of which continue to grow in spite of high nematode populations in the soil."

32

THE COVER, Dr. Dewey J. Raski (center) is chairman of the newly created Department of Nematology, University of California. He is assisted on the Davis campus by Bert Lear (left) and Benjamin F. Lownsberry (right).

BASIC STUDIES OUTLINED

Raski said it is hoped to develop something more accurate than the present rule-of-thumb for diagnosing nematode infestation before planting beets.

"If we can show the way by basic research," he said, "commercial laboratories or the companies may be able to test soil for beet growers."

Raski, who will continue to head sugar beet nematode research, explained that the cyst-forming group presents special problems. These nematodes survive as eggs in the cysts in spite of heat or the lack of moisture or host plants. Several years, at least three, are required to eliminate them by rotation.

Eggs in the cysts, he said, hatch in response to certain stimulants in root excretions of the host plant. Raski hopes to include in the beet studies biochemical research into the nature of this hatching factor. Out of it may come some means of hatching the eggs and killing the nematodes in the absence of the host sugar beets.

Soil fumigant research in the department will tie closely together fundamental studies and field work.

"As we use commercial materials in the field," said Raski, "we will be trying to understand more about both their effectiveness as fumigants and how they move in the soil. At Davis we shall be testing materials and trying new methods before we go into the field, but Riverside probably will do most of the screening of new chemicals."

On the faculty at Davis with Raski are Bert Lear and Benjamin F. Lownsberry. Work at Davis will include studies of nematodes affecting sugar beets, grapes, tomatoes, garlic, beans, the cucurbits (squash and similar plants), walnuts, peaches, and potatoes. At Berkeley, Allen's principal work will be with nematodes on cotton and alfalfa. At Riverside, S. A. Sher and Ivan Thomason will work with Baines. Principal crop interests there will be citrus, avocados, walnuts, peaches, beans, tomatoes, the cucurbits, and ornamentals.

Agricultural ancient history has its unexplained declines and crop failures in many lands, Raski commented. Some almost certainly were the result of nematode increase with repeated cropping. In western Europe, he said, nematodes virtually wiped out the sugar beet industry in the early 1800's until rotation cropping brought it back.

California has aged considerably since the Mission fathers planted their first wheat at San Diego in 1770 or 1771. But with the University expanding science's attack on the nematode, California agriculture should be able to age without decline.

NEMATODE RESEARCH

By GUY D. MANUEL
Vice President and General Agriculturist,
Spreckels Sugar Company

THE PROBLEM of nematode damage to the sugar beet crop is certainly not a new one. It has been with us for many years and little has been done to correct the problem other than rotation practices which permit a grower to live with the nematode. However, we are finding more and more damage from nematode in established beet districts and it has been evident that present rotation practices do not give the full control desired.

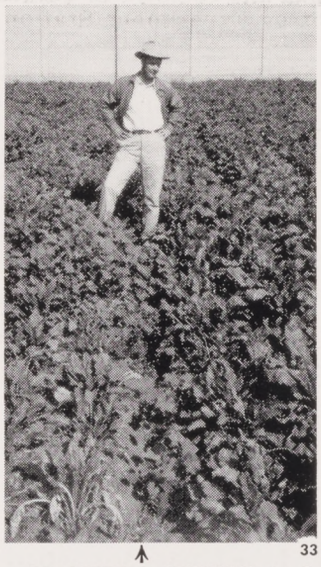
Recognizing the seriousness of the situation, the Beet Sugar Development Foundation, which is made up of all the sugar beet processors in the United States, has been making a concerted effort to bring the importance of the nematode problem to research workers. It is an odd fact that while nematodes attack many crops in many different areas, there is little known about them, and very few people are trained in this specialized field.

Through the efforts of the Foundation some work has been started, particularly in the field of plant breeding, where it is hoped resistance apparent in wild beet species can be transferred to commercial varieties. This work, while holding much promise, will undoubtedly be slow in bringing results.

One of the most significant steps in the effort to get more research work done has been the recent development of a cooperative program with the University of California at Davis and the Beet Sugar Development Foundation. The Foundation is making a grant to the University to enable it to carry on a project in which the sugar beet nematode will be studied in relation to the plant substances in the beet. This biochemical approach is quite new and it is hoped may lead to new fields of control while at the same time providing all research workers with a better understanding of the nematode. It is known that certain substances in the beet cause the sugar beet nematode cyst to germinate. If this material can be isolated, there is opportunity for control through soil treatment or possibly by elimination of this material through a breeding program. These studies may also consider many of the questions on what makes a beet variety resistant or subject to the nematode.

As noted in another article in this issue, the University of California has established a Department of Nematology and the sugar beet industry feels very fortunate in having the University undertake the project.

The United States Department of Agriculture has also made plans to increase its work on nematode control and it is anticipated that some of this new activity will be centered at Salinas to complement the present work on sugar beet research.



33

DR. RUSSEL T. JOHNSON stands between two sugar beet plots at the Spreckels' experimental farm. The right-hand plot has been soil-fumigated for nematode control.

The Spreckels Sugar Company as mentioned in the January-February, 1953, Sugar Beet Bulletin has continued to use its two experimental farms for nematode research. Excellent cooperation with the Dow, Shell and Stauffer chemical companies has made possible the testing of new soil fumigants and some look promising.

With the increased amount of research work there is now a real opportunity for new developments and progress toward solving this problem, which can become more acute if nothing is done to bring it under control.

A NEW METHOD OF BEET TOP RECOVERY

L. P. HANKS, a sugar beet harvesting contractor of West Sacramento, has designed and built a beet top cleaning and delivery attachment for his two-row Marbeet Harvester.

The harvester now delivers a stream of clean tops at the same time that beets are being delivered. The tops are gathered in a specially built trailer with a self discharging hopper.

The system has been used with much success in the Imperial Valley, where the harvest season terminated in July. Some of the tops were ensiled, while others were cured and chopped as dry feed.

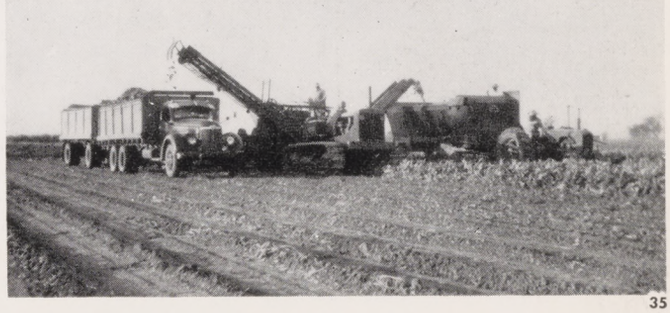
The choice of method of utilization depends on the grower's feeding facilities and on climate.

It seems newsworthy that for the first time a commercial beet harvester is delivering beets and clean tops simultaneously—an objective long dreamed about, but not until now accomplished.

A LOAD of clean tops in the Crose Automatic Feeder Trailer. →

L. P. Hanks Photos 34

THE HANKS Two-Row Marbeet harvester now delivers clean tops to a trailer alongside, while beets are delivered to the truck as usual. ↓

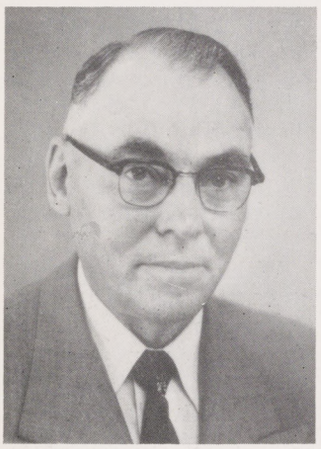


35

USDA SHIFTS SCIENTISTS IN SUGAR CROPS RESEARCH

DR. HEWITT M. TYSDAL, long engaged in plant breeding research in the U.S. Department of Agriculture, succeeds Dr. Cecil H. Wadleigh as head of the Sugar Crops Section, Field Crops Research Branch, Agricultural Research Services, Plant Industry Station at Beltsville, Maryland. Dr. Wadleigh becomes head of the Soil-Plant Relationship Section, Soil and Water Conservation Research Branch, also at the Beltsville station.

Dr. Tysdal began research work for the Department in 1928, with headquarters at the Nebraska Experiment Station, where he carried on cooperative studies in alfalfa improvement until 1943 when he was transferred to the Plant Industry Station, in charge of all research on alfalfa improvement. In 1948 he was put in charge of the Department's Salinas (Calif.) guayule program designed to improve that plant and its culture as a possible efficient



W. J. Mead Photos 36

DR. HEWITT M. TYSDAL

37

DR. CECIL H. WADLEIGH

source of natural rubber. He is leaving this work to take the assignment as head of Sugar Crops.

Dr. Tysdal was born at Lee, Ill., has a B.S.A. degree from the University of Saskatchewan, an M.S. from Kansas State Agricultural College, was a fellow of the American-Scandinavian Foundation (1927-1928) for research in Sweden, and has a Ph.D. in agronomy and plant breeding from the University of Minnesota where he became an instructor for one year before beginning joint work for the U.S. Dept. of Agriculture and Nebraska Agricultural Experiment Station. He carried on his agronomic and breeding work in alfalfa for a considerable number of years. From 1943-46 he was principal agronomist in charge of alfalfa breeding at the Plant Industry Station. Dr. Tysdal is a fellow in the American Association for Advancement of Science and the American Society of Agronomy, and is widely known for his special knowledge in the genetics and improvement of crop plants.

Dr. Wadleigh is a native of Gilbertville, Mass., has a B.S. degree from Massachusetts State College,

(Continued on Page 32)

ACREAGE CONTROLS FOR 1955?

By GUY D. MANUEL

Vice President and General Agriculturist
Spreckels Sugar Company

AS MOST readers of this article will recall, the sugar beet acreage contracted by the Spreckels Sugar Company for the 1954 crop which is now being harvested was controlled or limited. Originally we had intended to contract all the acreage that our three factories could accommodate. But last November when Mr. Lawrence Myers, director of the Sugar Branch, indicated that marketing allotments would be imposed on sugar beet processors in 1954, and that therefore it would be prudent for the industry to limit its 1954 production, we reduced the total acreage we would accept to an amount that would produce a quantity of sugar equal to our anticipated marketing allotment for 1954 plus a modest increase in our inventory.

Current crop reports indicate that 1954 will again see the beet sugar industry producing over its statutory quota and because of this some limitation on acreage will again be necessary. While 1955 beet contracting could again be handled by each processor, it is part of the responsibility of the Secretary of Agriculture under the Sugar Act to protect growers in their right to grow beets. Also the Secretary must see that excess inventories are not built up by the industry, as these excesses cannot be marketed under marketing allotments and would have a tendency to affect price and also the net returns to the grower because of high storage costs.

There are two approaches to achieving the control program necessary. In both cases marketing allotments must be imposed on individual processors because only the statutory limit of 1,800,000 tons of beet sugar may be sold during the year. The first approach is an industry program of control in which processors and growers would control their production to a figure near the 1,800,000 tons. The second is government acreage allotments (proportionate shares), made to states and their individual growers toward the end of producing 1,800,000 tons of sugar.

The former program has many advantages because it allows a greater freedom in meeting individual problems and needs, and can compensate for unusual conditions. However, it must have the agreement of the entire industry to be effective. The latter program would be of necessity, very rigid and inflexible, because it must take into consideration state and county boundaries, land history and be handled through state and county committees concerned with many other government programs in addition to sugar beet allotments.

To arrive at a method of approach to the control program, a meeting was called in Washington, D. C. in June by the Sugar Division of the Department of Agriculture. At that meeting it was the feeling of both growers and processors that if the industry could work out a program it would have many advantages. The major hurdle to such a program would

(Continued on Page 30)

ENCOURAGE FARM SAFETY

THE FARM can be a safe place to work—if you make it so.

To help all farmers and farm managers to promote safety, the Division of Industrial Safety, California State Department of Industrial Relations, has published a series of bulletins, gummed stickers and placards aimed at accident prevention on the farm.

These are free for the asking. Write to:

State of California
Department of Industrial Relations
Division of Industrial Safety
965 Mission Street, San Francisco 3

Specify in your letter which bulletin or form number is wanted.

Here is a list of the publications (an asterisk (*) means that the bulletin is available in Spanish also).

BULLETIN 103, "SAFE HANDLING OF LP-GAS," is a revised brochure on the subject. It gives the use and characteristics of LP-Gas, and the rules and standards that govern safe handling.

BULLETIN 104, "GROUND IT!" explains the necessity and wisdom of grounding electrical hand tools, and contains a sketch of proper connections for an electrical hand drill. It reminds us, among other things, that a current of only one-tenth of an ampere or less can be fatal.

*BULLETIN 105, "SHORING OF TRENCHES," reveals the heavy rate of fatalities in excavation work (compared with other construction) and gives safety measures that would eliminate cave-in accidents and injuries. It includes sketches of shoring and bracing required for different types of ground: running material; hard compact ground; and saturated, filled or unstable ground.

*BULLETIN 106, "LADDERS ON THE FARM," gives ladder pointers which, if followed, will reduce the righ rate of disabling injuries caused by poor farm ladders and improper use of sound ladders.

BULLETIN 107, "THE SHIP-SHAPE SHOP," shows how good housekeeping and maintenance in industry will save lives, save limbs, and save money. As a large percentage of occupational injuries results from poor housekeeping and maintenance, you will profit from the information in this brochure.

BULLETIN 108, "TAMING THE CIRCULAR SAW," deals with the most useful and at the same time the most dangerous of woodworking tools. It shows how proper guarding and instruction can reduce circular saw accidents to practically zero.

*BULLETIN 111, "FARM SAFETY CHECK LIST," is a safety guide for everyone on the farm. Follow the rules and you won't be one of the thousands injured each year on California farms.

*BULLETIN 114, "SAFE TRANSPORTATION OF WORKERS," covers the types of vehicles permitted for carrying workers to and from work, and gives methods of equipping the vehicles for safe transportation.

*BULLETIN 117, "STOP GRINDING OUT INJURIES!" is about the abrasive wheel, one of the commonest and most useful tools in industry. It gives pointers, which if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

*BULLETIN 119, "HOW TO LIFT," shows you how to lift safely, without pain or strain, and emphasizes the ten lifting commandments. **This bulletin available in Spanish only.**

BULLETIN 121, "LADDER SAFETY—STEP BY STEP," shows that there is no bad luck about ladders when you observe three common-sense precautions.

BULLETIN 122, "HANDY RULES FOR HAND TOOLS," reminds us that little hand tools can cause great injuries, and describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives and handsaws.

*BULLETIN 127, "LOOK OUT FOR YOURSELF IF YOU ARE AROUND CROP SPRAYING," is an illustrated booklet directed to the farm worker himself, and explains how pesticides can be used safely.

Gummed Labels Available

FORM 624, size 3"x5": "Warning. This Machine Is Automatically Controlled and May Start At Any Time."

FORM 685, Size 3"x5": "Sound Horn When Backing."

Placards Available, Size 8½" x 11"

FORM 615. "Stop Machinery Before Oiling, Cleaning, Repairing."

FORM 626. "Warning. This Machine is Automatically Controlled. It May Start at Any Time."

FORM 640. "Think Safely. Work Safely. Live Safely. We Want No Accidents on This Farm."

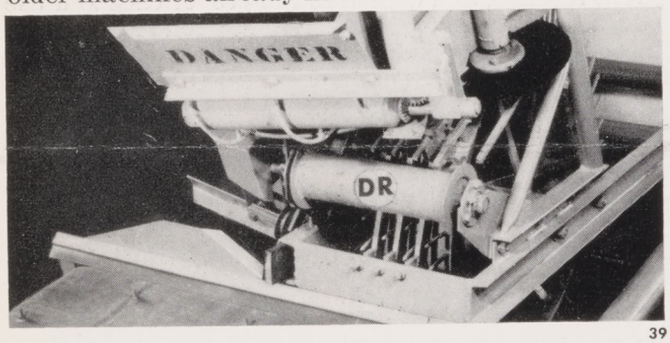
38

EXAMPLES of the many useful publications available from the State Department of Industrial Relations, Division of Industrial Safety, 965 Mission Street, San Francisco.

MARBEET HARVESTERS IMPROVED FOR 1954 PRODUCTION

BOTH THE Marbeet harvesters—the Midget and the Two-Row—have been redesigned for 1954 production. While these improvements are of a minor nature individually, they add up to an important increase in quality and quantity of work, and a reduction in maintenance.

All the changes shown here can be adapted to older machines already in use.



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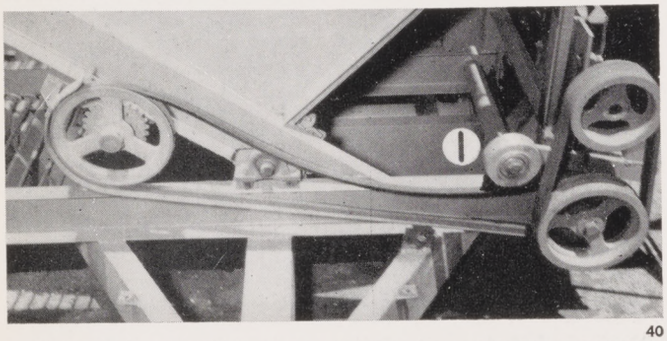
A DRIVEN trash roller (DR) eliminated plugging by heavy tops or weeds on the 1954 Marbeet Midget.



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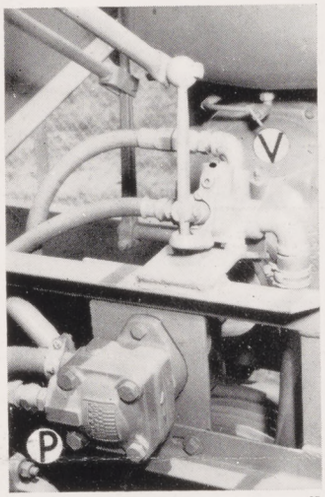
SMOOTHER, trouble-free starting and stopping of the TWO-ROW Marbeet elevator was accomplished by replacing the dog clutch with a belt-drive and tightening idler (I).



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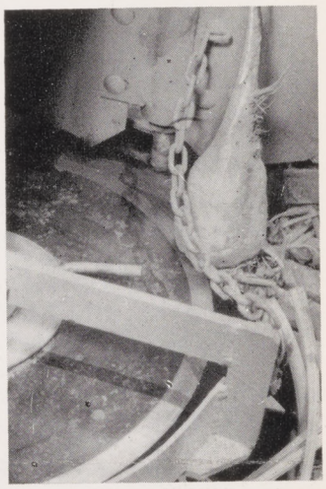
RAPID lifting of the Two-Row Marbeet sub-frame is accomplished with a direct-driven industrial type vane pump (P) and separate control valve (V).



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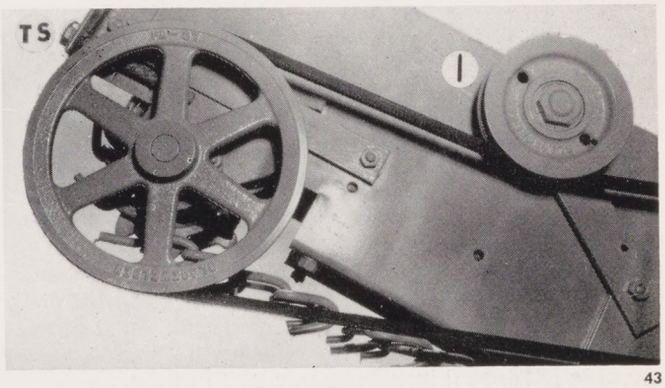
THE 1954 Two-Row Marbeet harvester has double-disk toppers, resulting in cleaner topping and less plugging than was present with the 3-disk topper previously used.



43

EASIER MAINTENANCE on the 1954 Midget beet elevator is achieved by new takeup screws (TS) and belt tightening idler (I).

ACREAGE CONTROLS?

(Continued From Page 28)

be the amount of acreage that could be given to the various areas. A committee was appointed to work on this problem and report back to the industry later.

In early July the committee submitted its recommendations to the entire industry at a meeting at Denver. It proposed to allow substantially the five year averages of planted acreage for each processor, and these in turn to be given out to their growers. There was general agreement on the program in its final form by most of the industry.

Before giving final approval to the program, the California processors met individually with the Directors of the California Beet Growers Association. The latter pointed out that the committee's proposal did not guarantee growers the right to contract with whichever processor (s) they choose, which right they would retain under a government-administered program. They asked that the processors agree to distribute acreage according to the committee's proposal so that this right would be maintained. This would mean that all California acreage would be put in a pool and administered by some agency such as the Growers Association.

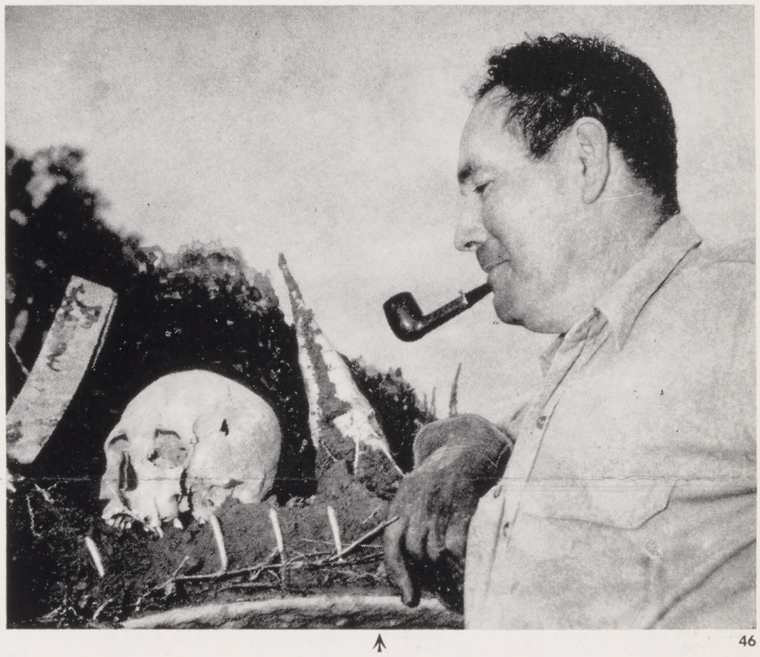
Because the Spreckels Sugar Company felt it could not risk the loss of any acreage that might come from a pooling program, it offered the Association an alternate program whereby the acreage assigned Spreckels would be divided by districts according to the five year history and then each district would have a formula of distribution worked out by the company and growers together.

After meeting with all processors the California Beet Growers Association said there did not seem to be any grounds for agreement and would vote against an industry program and ask for government controls.

(Concluded on Page 32)

University of California Photo. 44

45



46

HORRORS! Ramon Noriega casts a sympathetic glance at the skull of an Indian spiked on a harvester wheel on the Stinchfield ranch near Colusa. Those Marbeet Harvesters really get everything in the row.

PALM TREE?—No; a sugar beet four years old, kept alive and non-bolting with artificial climate at the Earhart Laboratory, Pasadena by U. C. plant scientist Albert Ulrich.

Beet Freaks

HUNGRY MOUSE. This meadow mouse (Microtus Californicus) has eaten almost all of the above-ground part of this sugar beet at Spreckels, and appears determined to finish the job.

LUCKY BEET—it grew through a horseshoe long buried in the field. Congratulations to Swingle Station Foreman Joe Marston for saving it from wrecking the slicing knives at the Factory.

47

USDA SHIFTS SCIENTISTS

(Continued From Page 28)

M.S. from Ohio State, and a Ph.D. (in plant physiology) from Rutgers where he was an assistant during his studies there, and was professor of agronomy at the University of Arkansas for five years before going to the Salinity Laboratory. He is known in plant and soils research fields for his knowledge of mineral nutrition, carbohydrate and nitrogen metabolism, water relations and salt tolerance. He is a member of the American Society of Agronomy, the American Society of Horticultural Science, and numerous other scientific societies; in 1951 he was president of the American Society of Plant Physiologists. In his two years directing the Division of Sugar Plant Investigations, he inaugurated several very important projects in sugar cane and sugar beet improvement, developed the facilities for research at field stations, and exercised strong leadership in the cooperative work between the industry and the Department of Agriculture.

ACREAGE CONTROLS?

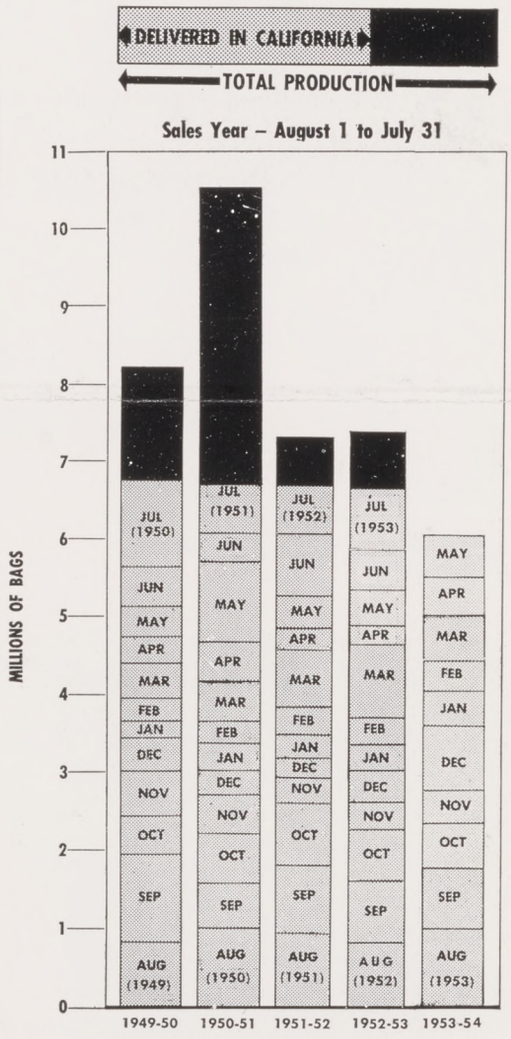
(Continued from Page 30)

With this disagreement as to method of allocating acreage, it now appears that no industry program will be forthcoming.

Late in July, Mr. B. Laurence Meyers, director of the Sugar Branch, announced that under whatever formula might be adopted by the government for alloting acreage, each beet-growing state would be a primary unit for allocation, with the exception of California where, because of different planting dates, the Imperial Valley would be a primary unit. After state allocations, it is probable that county, and finally, individual allotments will be made. Under a government administered program, land history as well as grower history will probably be given weight. This might cost the predominantly tenant grower of California some loss of acreage history as an individual.

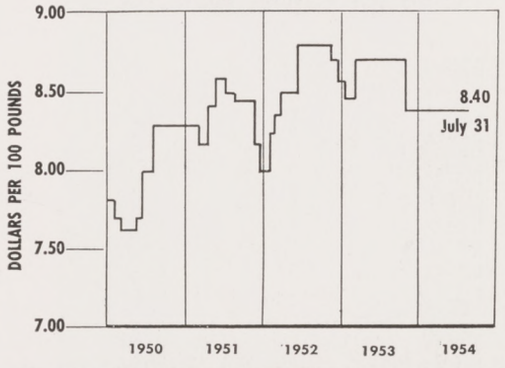
To conclude this report and come back to the question asked in the title — It appears that acreage controls will be necessary for the 1955 crop and undoubtedly beet acreage will in total be less than for the 1954 crop. It also appears at this writing that these controls will come through government channels. Hearings are scheduled in the near future to discuss the allotments with the government and it is hoped that definite allotments can be given out late in September.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

49

GARDEN OR DESERT?

Water is the only difference. If it is ground water pumped from wells, it will be depleted unless

DRAFT = RECHARGE

Present pumping rates in parts of the San Joaquin Valley far exceed natural recharge. See page 34.

Vol. 18 · SEPTEMBER - OCTOBER, 1954 · No. 5

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

U.S.G.S. REPORTS ON WEST SAN JOAQUIN GROUND WATER CONDITIONS

A REPORT on "Ground-Water Conditions in the Mendota-Huron areas, Fresno and Kings Counties, California",* recently prepared by the U.S. Geological Survey in cooperation with the California Division of Water Resources, has been released to the public, and has become available for public distribution in a limited number of copies.

This report covers an extraordinarily pains-taking study made by the United States Geological Survey in order to present a true picture of ground water consumption and recharge in an area of California which is of tremendous importance agriculturally, and yet which is suffering from a rapid depletion of ground water, far beyond present sources of recharge.

The report is voluminous, containing 102 pages of text and 18 plates. Fortunately, the report includes a concise summary which is here reproduced.

SUMMARY

The Mendota-Huron area of this report includes 1,300 square miles on the central west side of the San Joaquin Valley, extending from the Fresno-Merced County line southward to Tulare Lake.

Use of ground water for large-scale irrigation began in 1915 and expanded until the late twenties. Development was slow in the thirties but was accelerated by the high prices during the second World War and has expanded rapidly since 1945. The number of irrigation wells in the area increased from about 300 in 1941 to about 1,000 to 1951. Pumping draft from the area in acre-feet per year increased from about 100,000 in the early thirties to 1,000,000 in 1950-51 and 1,200,000 in 1952-53.

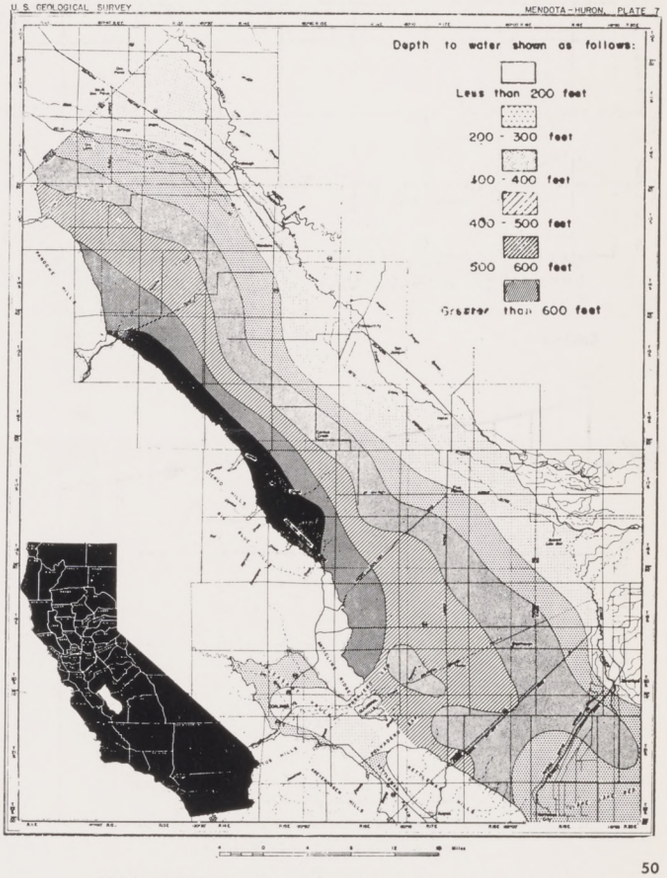
The heavy and increasing draft on ground-water supplies has been far in excess of replenishment and water levels have been declining at a rapid rate, especially since 1945.

In connection with the need for importation of surface water to make up the deficiency in supply, the present investigation of ground-water conditions has been made at the request of and in cooperation with the State of California.

Field activities in this study included a canvass of about 1,700 wells, collection of 430 drillers' logs and 200 electric logs, assembly of some 20,000 water-level measurements from other agencies and several thousand additional measurements by the Geological Survey, and collection of about 1,500 chemical analyses of waters, of which 800 were made as a part of the investigation.

WHAT THIS STUDY REVEALED

The deposits containing fresh water beneath the Mendota-Huron area are of Recent to Pliocene age. They extend to depths of less than 1,000 to at least 3,000 feet below the land surface. They can be divided into (1) an upper unit of clay, silt, and sand, chiefly alluvial-fan deposits of heterogeneous character, that extends from the land surface to a depth of 400 to 800 feet, and that is chiefly of Quaternary age; (2) a middle unit consisting of an impervious diatomaceous clay ranging in thickness from 20 to 120 feet, and of late Pliocene age; and (3) a lower unit of clay, silt, and sand, in part lacustrine deposits, commonly 600 to 1,500 feet thick but locally as much as 2,500 feet thick, that extends down to the beds containing saline water. This lower unit is of Pliocene age.

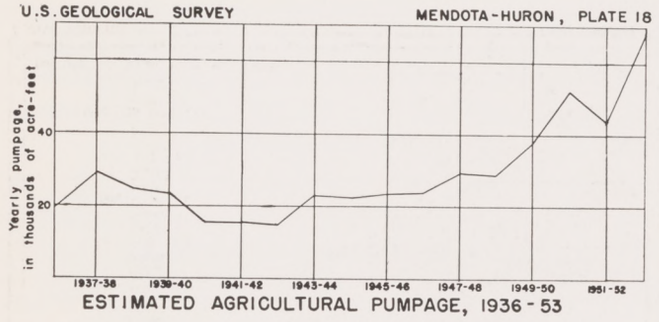


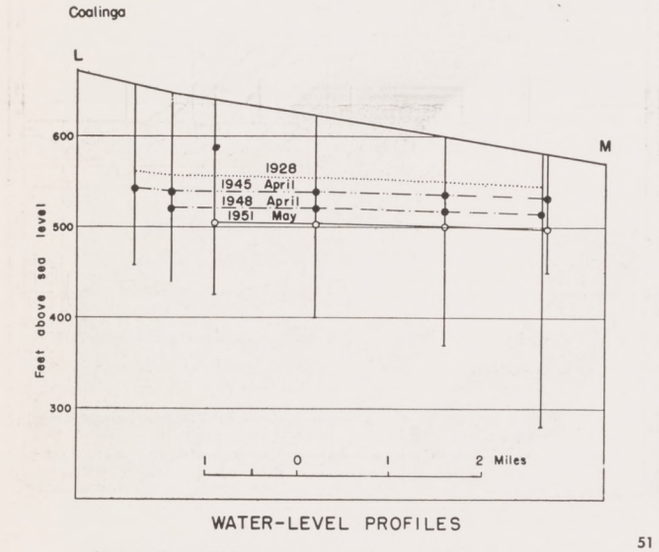
MAP OF THE Mendota-Huron Area, showing depth to pumping level in wells, 1950-51.

A body of semiconfined ground water, the upper water-bearing zone, occupies most of the upper unit. This upper zone is of low to moderate permeability. Locally, southeast of Tranquillity, it is the principal source of ground water for irrigation. There, well yields average about 1,300 gpm and specific capacities about 60 gpm per foot of drawdown. Elsewhere, the upper zone yields water chiefly to wells that tap the lower zone as the principal source but are perforated or leaky in the upper zone.

The body of ground water in the lower unit, the lower water-bearing zone of this report, is confined almost everywhere by the diatomaceous clay. Probably 80 percent or more of the irrigation draft is from this lower zone. Average yield of irrigation wells is about 1,100 gpm and specific capacity about 40. Near Westhaven, permeability of the lower zone

*"Ground-water conditions in the Mendota-Huron area, Fresno and Kings Counties, California", by G. H. Davis, J. P. Poland and others. Prepared in cooperation with the California Division of Water Resources, Sacramento, California, June, 1954.





51

GROUND-WATER pumpage and water level profiles in Pleasant Valley, near Coalinga

is about 110 gpd per square foot and transmissibility about 120,000 gpd per foot.

A body of brackish to saline water underlies the lower water-bearing zone throughout the area. Depth to this body of saline water ranges from less than 1,000 to at least 3,500 feet below the land surface.

Movement of ground water in both the upper and lower water-bearing zones initially was from the foothills of the Coast Range on the west toward the axial trough of the valley on the east. Hydraulic gradients were gentle—a few feet to the mile. In most of the area the gradient in the upper zone still is toward the valley axis, although locally in the area of heavy pumping from that zone southeast of Tranquillity the water levels have been drawn down sufficiently to develop a gradient westward from the axis.

EFFECTS OF OVERDRAFT

In the lower water-bearing zone, the heavy pumping draft has drawn down the piezometric level (water table) as much as several hundred feet in the past 20 years. As of 1951 the confined water in the lower zone was moving from the east and northeast into an elongate pumping depression which extends the full length of the Mendota-Huron area and whose axis is only 4 to 6 miles east of the western edge of the valley.

The decline in the piezometric level of the lower water-bearing zone since large-scale irrigation began during the first World War has ranged from 150 feet near Mendota on the north to roughly 300 feet in the vicinity of Huron on the south. Most of this decline has occurred since 1940. Since 1945 the average rate of yearly decline has been 4 to 7 feet in the northern part and 20 to 30 feet in the southern part of the area. As of 1951 the pumping lift in the Mendota-Huron area ranged from 100 feet below land surface near Tranquillity to more than 700 feet near the mouth of Cantua Creek; the average lift to land surface was on the order of 400 feet.

RECHARGE SOURCES

Under native conditions the only appreciable source of recharge to the ground water was by seepage from west-side streams; the average long-term seepage is estimated as 30,000 to 40,000 acre-feet a year. Drawdown of the water levels, especially the piezometric level of the lower water-bearing zone, has developed a westward gradient of as much as 15 feet to the mile (1951) and ground water now is moving southwest beneath the axial trough of the valley. Thus the lower zone is receiving induced or secondary recharge from the east side of the valley along the full 71-mile reach of the Mendota-Huron area. As of 1951, it is estimated that the secondary recharge to the lower water-bearing zone from the northeast was 150,000 to 200,000 acre-feet a year.

Secondary recharge to the upper water-bearing zone by westward movement from the axial reach to the area of sustained pumping from that zone is estimated as 20,000 to 30,000 acre-feet as of 1951.

Thus, the secondary recharge from the northeast to both water-bearing zones of the Mendota-Huron area is estimated as on the order of 200,000 acre-feet as of 1951. If added to the primary recharge from west-side streams, the total recharge as of 1951 appears to be roughly 230,000 acre-feet.

PRESENT RECHARGE INADEQUATE

Based on consumptive-use estimates by crops, the net ground-water draft in 1950-51 was on the order of 600,000 acre-feet or 60 percent of the gross pumpage. The indicated overdraft as of 1950-51 was on the order of 350,000 acre-feet. As of 1952-53 pumpage had increased to 1,240,000 acre-feet and if consumptive-use requirements remained constant at 60 percent of water pumped, they were roughly 740,000 acre-feet as of 1952-53. Imports sufficient to satisfy consumptive use of at least 700,000 acre-feet would be indicated, plus additional requirements to compensate for outflow and to provide for salt balance.

WATER QUALITY

The chemical quality of the waters in the Mendota-Huron area is fairly consistent within each water-bearing zone but is markedly different between the two zones.

Ground waters of the upper water-bearing zone generally have high concentrations of calcium and magnesium sulfate. Waters in the upper 200 to 300

STATUS OF PROPORTIONATE SHARES FOR 1955 CROP

By GUY D. MANUEL
Vice President and General Agriculturist, Spreckels Sugar Company

CALIFORNIA sugar beet processor and grower representatives met with the State Agricultural Stabilization and Conservation Committee Wednesday, September 8, to discuss means of apportioning whatever sugar beet acreage the state's growers will be permitted to plant in 1955. The discussion was limited generally to the broad means of apportioning acreage to the individual grower and no attempt was made to develop formulae or to solve other problems which may arise. Since California's share of the national sugar beet acreage has not yet been announced and until some measure of the acreage desired by the state's growers can be determined, it is impractical to speculate on a specific formula that might be used. The group approved appointment of a nine-member board which will be responsible for recommending a course of action to the State A.S.C. Committee for all the diverse problems of request for and allocation of individual 1955 proportionate shares.

At the first board meeting on September 14, the nine-man committee was officially named "State Advisory Committee on 1955 Proportionate Share Sugar Beet Acreage". The nine men consist of eight industry representatives and one member of the State A.S.C. Committee. The industry members are divided equally between the processors and the growers, four from each segment. Each member of the advisory committee has an alternate so that equal representation is assured at all times. Mr. George Clever of the State A.S.C. Committee was elected chairman and Arnold Frew, president of the growers' association, was elected vice-chairman.

In its first meeting, the advisory committee approved a form to be used by the growers in requesting a proportionate share. These forms (see cut) have been available to growers since the week of September 20, and can be obtained from processors' agricultural staffs or county A.S.C. offices.

All parties concerned with the acreage allocations of 1955 are impressed with the importance of timing, and growers are urged to make haste in planning for the coming crop year and in filing their requests. A deadline for filing requests will probably be established in the near future.

Headquarters County.....

REQUEST FOR SUGAR BEET PROPORTIONATE SHARE

I hereby request a proportionate share of.....acres under the 1955 Sugar Beet Program.

It is my intention to grow sugar beets in 1955 and the following worksheet farms will be under my control in 1955 and comprise my 1955 farming unit:

County and W/S No.*	Name of Owner	Identification of Farm	Sugar Beet Planted Acreage 1950	1951	1952	1953	1954	Estimated 1955
		Totals						

In addition to the above, I expect to lease.....acres for sugar beet production in 1955.

*All land controlled during the 1955 sugar beet growing season should be entered whether or not beets have been or are to be grown on the land.

I have grown the following acreages of sugar beets as operator of a farm (either as tenant or owner) in the last five years:

County or Counties Where Grown	Year	Acreage	Sugar Company
	1950		
	1951		
	1952		
	1953		
	1954		

This (is) (is not) the only request which I will file for a 1955 proportionate share.

Signature of Operator ..... Signature of Reporter ..... Date .....

REMARKS:.....

Title ..... Signature .....

ORIGINAL

52

FACSIMILE OF form used in requesting proportionate share for 1955 crop.

feet below land surface have dissolved solids of about 3,000 ppm and percent sodium of about 35. Hardness is 1,200 to 1,600 ppm. Waters from about the 300-foot depth to the top of the diatomaceous clay show a general vertical decrease in dissolved solids to about 1,500 ppm, and an increase in percent sodium to about 55 in the deeper waters. Hardness decreases to roughly 450 ppm. In the area southeast of Tranquillity, where pumping from the upper zone is greatest, dissolved solids are roughly 850 ppm and percent sodium about 60. Locally waters of greater concentrations or different types occur.

Chemical quality of the waters in the lower water-bearing zone is fairly constant, if wells tapping only that zone are considered. The water is primarily a sodium sulfate type, the dissolved solids are about 800 ppm, and the percent sodium is about 75. Hardness ranges from 50 to 150 ppm and chloride is generally 100 ppm or less. Locally near Westhaven a basal sodium chloride water occurs below about 2,000 feet. The blend of this water with the overlying water of the lower zone as discharged from wells averages about 900 ppm in dissolved solids and the percent sodium is about 90.

BEET SUGAR INDUSTRY LAUNCHES NEW PUBLIC RELATIONS PROGRAM

By HERMAN F. MERTENS
Publicity Director
Western Beet Sugar Producers, Inc.

CALIFORNIA sugar beet growers, along with growers in twenty-one other western states, will be beneficiaries of a new public relations program recently launched by the Western Beet Sugar Producers, Inc.

The program is designed to build a more favorable public attitude not only toward beet sugar as a product but also toward the entire beet sugar industry.

A primary objective will be to create greater public recognition of the importance of sugar beets to western agriculture and therefore to the entire West.

It is generally recognized that a fundamental part of any complete sales program is a favorable public attitude toward the product being sold and the industry producing it. So, while it is not a direct merchandising effort, the WBSP program will provide a more solid foundation for the sales work of the beet sugar processing companies serving the West.

Launching of the public relations program marks a transition to a new phase in WBSP activities. Previous efforts have emphasized merchandising and paid advertising of beet sugar. The program now will stress personal contacts with influential individuals and groups, and favorable publicity for the entire industry as well as the product.

Spreckels Sugar Company is one of the eleven companies that support Western Beet Sugar Producers, Inc. Charles de Bretteville, Spreckels president is on the WBSP board of directors, and Guy D. Manuel, vice president of Spreckels, is a member of the three-man management committee.

The public relations program is being directed by Harold O. Belknap, WBSP general manager.

Cal-Pictures 53

HAROLD O. BELKNAP
General Manager

HERMAN F. MERTENS
Publicity Director

WESTERN BEET SUGAR PRODUCERS, INC.
2 Pine Street, San Francisco

Mr. Belknap became general manger earlier this year after many years of public relations experience for an important part of the nation's food industry, closely associated with agriculture.

Shortly before being selected to head the beet sugar organization, he was "drafted" by the federal government to serve the U. S. Department of Agriculture as a special consultant on public relations.

All the "tools" of the modern public relations profession will be used to accomplish the aims of the WBSP program.

These will include favorable publicity for beet sugar and the beet sugar industry in newspapers and consumer magazines, news stories in farm journals, movies and talks before consumer groups, radio and television appearances, personal contacts with leaders of influential groups, and a variety of other activities.

A positive approach will be taken. Beet sugar will be promoted on its own merits as an unsurpassed sweetening agent, and not by comparing it with other types of sugar.

By means of regional offices, the organization will be able to maintain close contacts with the industry and with influential groups throughout the twenty-two state area. Eventually six regional offices will be in operation, blanketing the entire western United States. Development of the program will be gradual. Experience will be gained on a limited scale before the organization is built to its full strength.

Experienced home economists will be responsible for much of the job of carrying "the beet sugar story" to women and other buyers of sugar. With cooking demonstrations and personal visits, the home economists will tell the story to teachers, food editors of newspapers, women's organizations, home economists in business, and others who buy sugar or influence other people in the purchase of sugar.

Radio and television appearances will also be made, to reach housewives not active in organized groups.

Managers of the regional offices will bring the story to still other individuals and groups—through publicity, personal contacts, booking of films about the industry, etc.

A new motion picture is planned. It will stress the importance of the entire industry to the West. This was touched only lightly in the present WBSP film, "Sugar, U.S.A.," which will continue to be circulated.

The need for a specific public relations program has long been recognized in the industry. Every business depends upon public approval for its success. As every sugar beet grower knows, the beet sugar industry operates under strict government regulations and therefore depends upon public approval even more than most businesses.

Thus it is not merely desirable—it is absolutely essential for its continued existence that the industry create and maintain the best possible public good will. Without the legal stabilization of the industry, sugar beet growers could find themselves without a market for their product—or a market obtained only at ruinous prices. (*Continued on Page* 40)

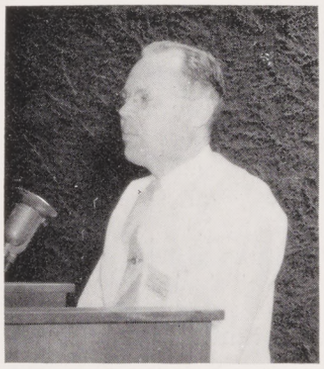
AGRONOMY FIELD DAY AT DAVIS

ON SEPTEMBER 3, the Department of Agronomy, University of California, was host to nearly 300 guests attending the Annual Agronomy Field Day at Davis.

The morning program was devoted to field demonstrations of experimental work relating to the growing of sugar beets. Enlightening reports of these studies were presented by six of the staff in accordance with the following program:

Green Manures	W. A. Williams
Sugar Beet Climate Study	A. Ulrich
Water Grass Control	D. Ririe
Sugar Beet Varieties	J. S. McFarlane
Mechanical Thinning and Population Studies	F. J. Hills
Irrigation with Respect to Beet Harvest	D. Ririe

Guests enjoyed a buffet lunch at the Sunken Garden, followed by a formal welcome from Dr. M. L. Peterson, Chairman of the Department of Agronomy and an address by Wayne F. Weeks, Acting Director, University of California Agricultural Extension Service. Mr. Weeks told of the dominant part played by state participation in California's Agricultural Extension Service. The afternoon field program stressed projects in beans, corn, and small grains, while a panel discussion on diseases and pests of sugar beets was programmed at Hunt Hall auditorium. Participants were: Dr. C. W. Bennett, Plant Pathologist, USDA Salinas; Dewey J. Raski, Chairman, Department of Nematology, University of California; Dr. John McFarlane, Plant Breeder, USDA, Salinas; F. J. Hills, Extension Agronomist, University of Calif.



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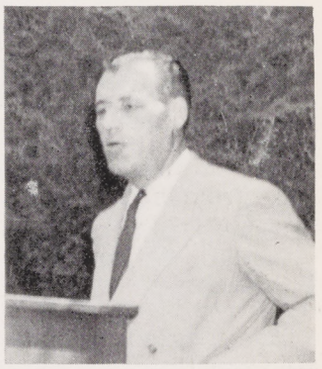
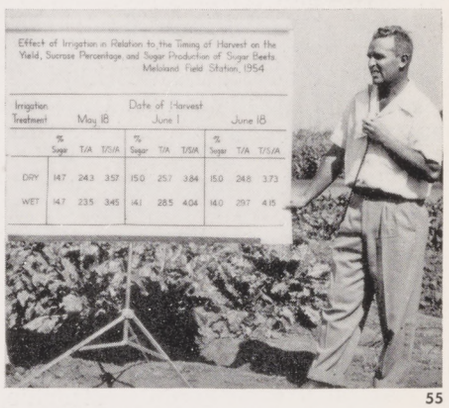
DR. M. L. PETERSON, Chairman, Department of Agronomy, extended a warm welcome to two hundred ninety-four guests. He set forth the aims of the Department and the many problems of California agriculture under study.



WAYNE F. WEEKS, Acting Director, University of California Agricultural Extension Service, presented an impressive address on the magnitude of California's agriculture, and its relation to the Extension Service.

WATER GRASS control was demonstrated by David Ririe. Water grass is one of the hardest weeds to control because nearly all chemicals which kill water grass damage the beets. While no completely selective chemical has yet been found, DALAPON comes the closest.



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HOW LONG between last irrigation and harvest for maximum yield? This is a complex question, with many factors affecting the answer. In the Imperial Valley, the answer is simple—continue irrigation up to the date of harvest in order to assure maximum tonnage and sugar per acre.

ALBERT ULRICH explained the elaborate climate studies being conducted cooperatively throughout the United States. Beets of the same variety are grown on a standard nutrient solution; differences in yield or sugar content are then due to climate alone.

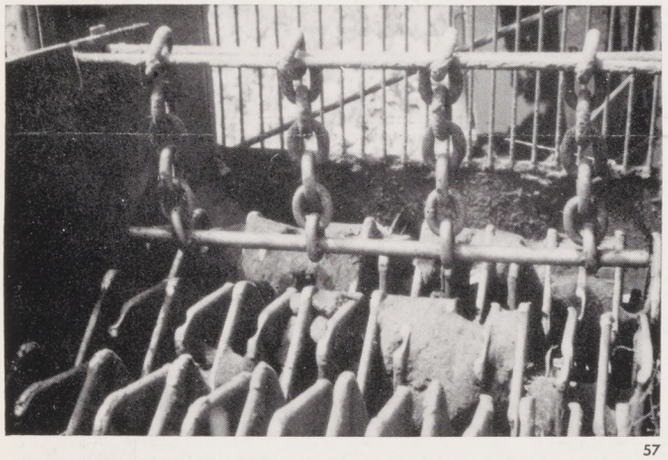
DR. JOHN McFARLAND, USDA geneticist at Salinas, explained the growing complexity of California's need for special beet varieties. The presnt "Standard" varieties offer resistance to Curly Top, Downey Mildew and Bolting. But there remains the possibility of breeding resistance to Nematode, Virus Yellows and Cercospora leaf spot, and inclusion of the monogerm characteristics in all of the new varieties.

56

A PANEL of experts discussed sugar beet problems. (L to R) Dewey Raski, C. W. Bennett, John McFarlane and F. J. Hills gave progress reports and answered questions on control of sugar beet nematode, of virus yellows, and of Cercospora leaf spot. Present control methods include rotation and cultural practices, while the future may see the plant breeder contributing new varieties, resistant to these pests.

SPRECKELS GROWERS DEVISE HARVESTER IMPROVEMENTS

NICK CAPITANICH, a harvesting contractor of Watsonville, is delivering exceptionally clean beets from his two-row Marbeet harvester by the simple expedient of hanging an iron bar just above the last filter roll. The bar is suspended by heavy chains, whose weight combines with that of the bar to retard the beets as they pass over the filter rolls.



57

NICK CAPITANICH devised this chain-suspended bar for retarding beets on the filter rolls of his two-row Marbeet Harvester.

Ferreira Brothers, who grow beets on Elkhorn Road, north of Sacramento, have made two valuable improvements on their Marbeet Midget. In order to handle high tops and the bolters which will probably appear on over-wintered beets, they installed a double defoliator blade. The space between blades is about 5" so that large tops and stalks are cut twice instead of once, resulting in a very much better disintegration of foliage.

To speed up unloading of the trailer cart, Ferreira Brothers installed a hydraulic cylinder for engaging the V-belt drive of the unloading conveyor. They also installed two C-section belts instead of the standard single belt. This pair of belts has lasted two seasons without showing any wear, and the hydraulic control not only saves a frequent wrenched back, but also speeds up the unloading operation.

58

JUNIOR FERREIRA operates the hydraulic control valve which produces instantaneous engagement of the discharge conveyor on the trailer cart.

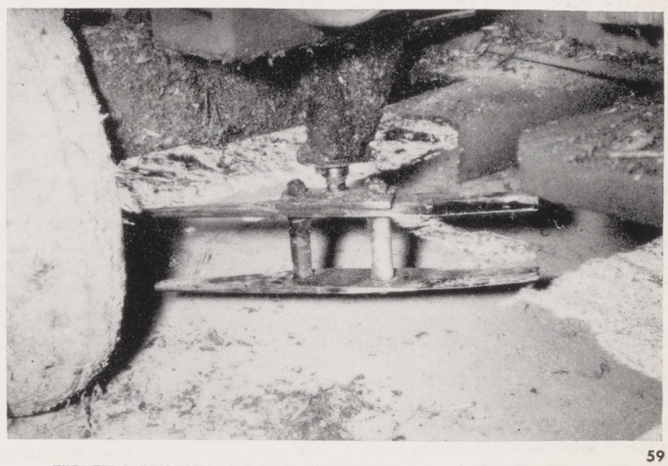
DOES LEACHING ROB OUR PRE-PLANT FERTILIZER?

By DONALD R. HEFNER
Field Superintendent, Spreckels Sugar Company

THIS year we studied a sizeable acreage of fall pre-fertilized sugar beets to ascertain whether or not this practice led to earlier production of tonnage and sugar content. As a result of this study, we believe that there exist certain conditions under which fall pre-planted nitrogen is lost by leaching, and satisfactory yields require later application of nitrogen.

Late fall applications of anhydrous NH_3 have been made in the belief that the gas was fixed in the soil until such time as soil temperatures reached 50 degrees and that this doesn't usually occur until most of our heavy rains are past. Our beets then have an excellent start, and we would have one operation out of the way. In most instances, we advocated the entire application because we found no experimental data that gives any evidence that two applications are more effective than one. But this premise presupposes no large amount of leaching.

The Dixon Dryer Company contacted us in June to discuss the problem of one of their fields that had been fertilized before planting and was showing severe yellowing. The field was one that had in past years shown signs of extreme fertility and had in no way been farmed out. The field had been divided into two sections. Section A received 160 pounds of NH_3 in the beds in December. Section B received 80 pounds in December, and a second application of 80 pounds NH_3 in April. The two parts received identical care and watering in all respects except for the application of the fertilizer. The field as a whole progressed exceptionally well until the early part of June when it yellowed perceptibly, but because of the 130 pounds of Nitrogen added, it was felt that it had yellowed due to a temporary unbalance between requirements and available nitrate and would green up as soon as the weather warmed up and more water was applied. But, it did not turn green. The severe yellowing of maturity gave us visual evidence



59

FERREIRA BROTHERS' double defoliator blade does a superior job of disintegrating foliage.

that there was a nitrate starvation. To follow this further, we petiole-sampled the two sections of the field and found 250 P.P.M. of nitrate in that portion fertilized with one application and only 225 P.P.M. of nitrate in that with two applications. Both were well below the critical level, so we recommended an immediate application of fertilizer. From the foregoing, we could draw only one conclusion—the fact that due to the mild winter and large amount of rainfall occurring in a short space of time, the NH_3 had nitrified and leached out of the root zone. The question of what happened to the fertilizer can be answered by a consideration of the extremely open fall permitting early fertilization and planting; the porous condition of the soil due to deep chiseling; the mild but very wet period from January 15 to February 18, and the fact that the daily mean temperature for the 20 days from February 20 to March 10 averaged 57 degrees. Nitrification undoubtedly was taking place and when the first irrigation occurred in early May, (amounting to an acre foot of water), the nitrate was leached down into the soil. The first signs of yellowing followed the initial irrigation and could be seen progressing across the field behind the water.

This is not intended as a condemnation of the entire program of pre-fertilization, but is intended to show what did happen last year and what could happen should the same circumstances arise again. Remember that this was a December application of NH_3 which is not as early as some fields were fertilized. These latter undoubtedly lost even more than this particular field did. It must be said, however, in defense of this early application that the beets were of larger size by June 1 than ordinarily fertilized beets where the application occurred after thinning.

Where the possibility of leaching is suspected, it might be well to apply from 30 to 50 pounds of nitrogen as a preplant, and the balance after the field has been thinned and hoed. By following this program, fertilizer loss by leaching would be reduced, and early growth would be stimulated.

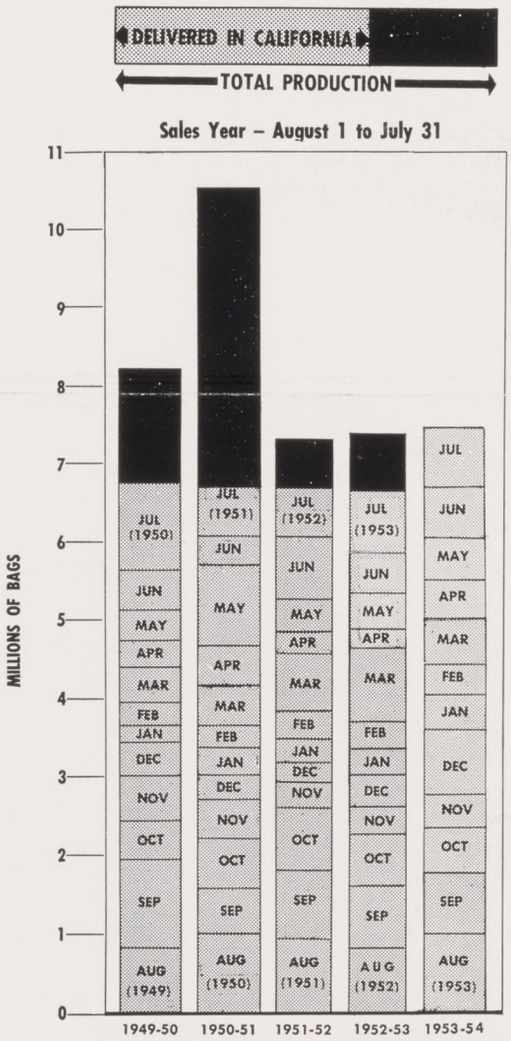
PUBLIC RELATIONS PROGRAM

(*Continued From Page* 37)

The program of Western Beet Sugar Producers is not a glamour program. It does not promise to transform public attitudes toward beet sugar or toward the beet sugar industry overnight.

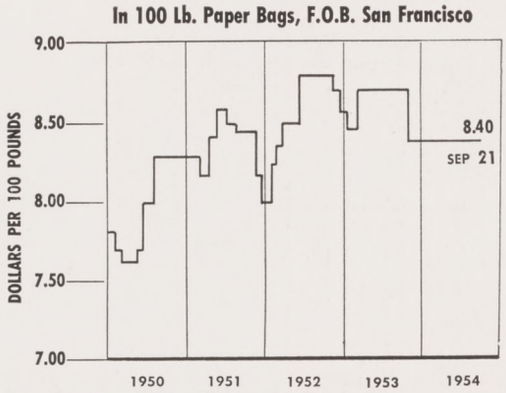
It will take time and patience to accomplish the objectives. Public opinion is formed slowly. Prejudices—such as the unfounded prejudice against beet sugar in some localities—hang on with irritating persistence. It takes hard, plugging work and constant hammering at an idea to have an effect. But there are many, many examples to show that a continuous, long-time program of this kind pays off.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers.
Mention of specific methods, devices or implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.
AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

SPRECKELS SUGAR BEET BULLETIN

61

SERVING SUGAR BEET GROWERS

is the aim of both Agricultural and Operating Departments of Spreckels Sugar Company

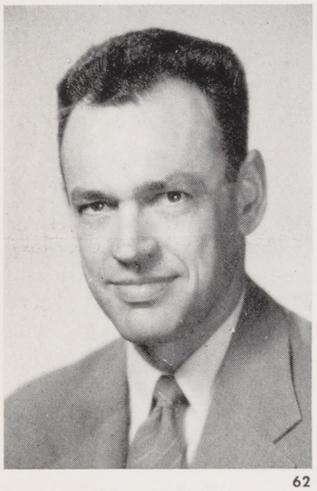
THREE FACTORIES
THREE AGRICULTURAL DISTRICTS
THIRTY-THREE RECEIVING STATIONS

integrate their activities to best serve the sugar beet growers of central California

Vol. 18 NOVEMBER - DECEMBER, 1954 No. 6
PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

CHANGES IN THE AGRICULTURAL DEPARTMENT

By GUY D. MANUEL
Vice President and General Agriculturist,
Spreckels Sugar Company



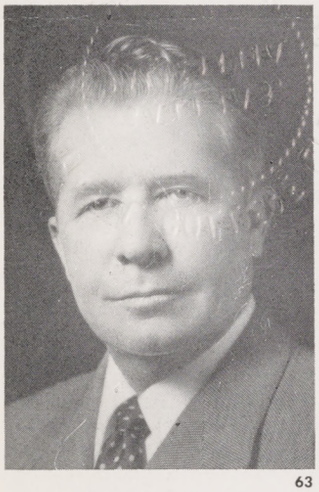
62

GUY D. MANUEL
Vice President and General Agriculturist, San Francisco

THE CHIEF responsibility of the agricultural department is to obtain and deliver to our factories adequate supplies of sugar beets. To insure these supplies against diseases and pests of the crop, changes in economic conditions, and other adverse circumstances, it is essential for us to contract acreage over an extended area.

In recent years, as new varieties of sugar beets have been developed and as sugar beet cultural practices have improved, this area has expanded. With its expansion has come the necessity of changing the organization of our department in order to maintain the best in service to all our growers. These changes, effective by the end of February, are as follows:

The Sacramento office, which has heretofore been responsible for agricultural supervision and agricultural accounting for the entire Sacramento-San Joaquin Valley, will be closed shortly after the first of the year. In place of the Sacramento office, two new district offices will be created: one at Manteca, to serve growers in the San Joaquin Valley; and the other at Woodland, to serve growers in the Sacramento Valley.



63

HUGH F. MELVIN
Agricultural Manager, San Francisco

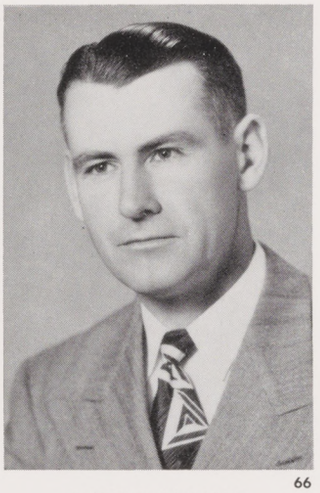
Upon the closing of the Sacramento office Hugh F. Melvin, Manager of the present interior valley agricultural district, will become Agricultural Manager, a new position in the department with headquarters in San Franicsco. Mr. R. S. Lambdin, Mr. Melvin's assistant, will become District Manager of the San Joaquin Valley area with headquarters at the Manteca factory. This district will include all Spreckels' beet growing areas in Fresno, Kern, Madera, Merced, San Joaquin and Stanis-

64

GEORGE P. WRIGHT
District Manager, District 1, Spreckels

65

WILLIAM H. PAULSEN
Agricultural Superintendent, District 1, Spreckels



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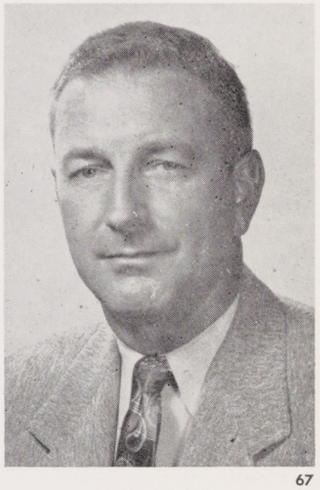
RALPH S. LAMBDIN
District Manager, District 2, Manteca



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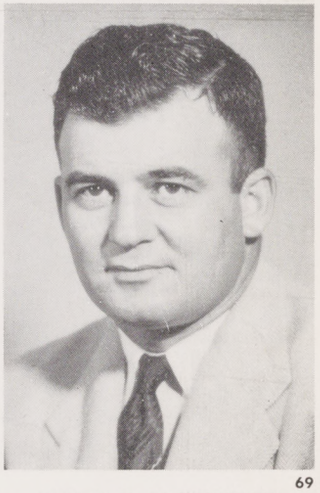
DAN DIETER
Agricultural Superintendent, District 2, Manteca

68

HARRY J. VENNING, JR.
District Manager, District 3, Woodland



69

WALTER H. BUCKINGHAM
Agricultural Superintendent, District 3, Woodland

laus counties. Mr. H. J. Venning, who has been assistant to Mr. G. P. Wright, Manager of the Salinas Valley district, will manage the Sacramento Valley district which includes Colusa, Sacramento, Solano, Sutter, Yolo and Yuba counties. The headquarters for this latter district will be at the Woodland factory.

Mr. Melvin has been associated with the Spreckels Sugar Company since 1924 and has held a number of administrative positions with the company. He has served as a District Manager for the last twelve years. His new position will be to coordinate the activities of contracting, planting, harvesting, etc. in the three agricultural districts.

Mr. Lambdin began his career with the Spreckels organization as a trainee in 1938 and has spent most of his time in the Salinas Valley area. For the last two years, however, he has been Assistant District Manager for the Sacramento-San Joaquin Valley and is therefore well acquainted with the growers of the area he will manage. Mr. L. D. Dieter will assist Mr. Lambdin as the Agricutural Superintendent.

Mr. Venning started as a trainee in the Agricultural Department in 1939. He has spent a major portion of his time with Spreckels in the Sacramento Valley area, having served as the Assistant District Manager in that area from 1950 to 1952. More recently, he has held the same position under Mr. Wright in the Salinas Valley. Mr. W. H. Buckingham will assist Mr. Venning as the Agricultural Superintendent.

The Salinas District will remain unchanged with Mr. George P. Wright as District Manager and Mr. W. H. Paulsen as Agricultural Superintendent.

While these changes will become effective very soon as far as operations go, the relocation of the individuals concerned will be delayed until office accommodations are completed at the factories.

AGRICULTURAL RESEARCH - A SERVICE TO GROWERS

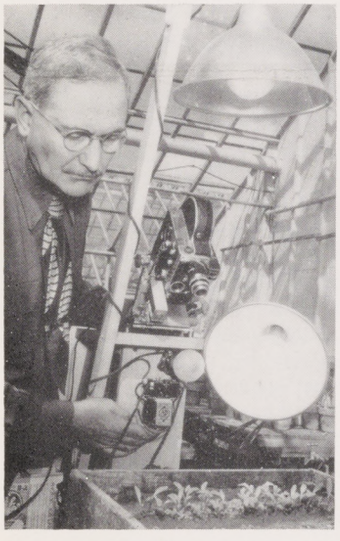
By DR. RUSSELL T. JOHNSON

Director of Agricultural Research, Spreckels Sugar Company

THE AGRICULTURAL RESEARCH DEPARTMENT of Spreckels Sugar Company owes its existence to the Company's policy of providing every possible assistance to the profitable growing of sugar beets.

In carrying out this policy, a program is maintained wherein pure research and applied research are kept in balance. Thus, while much of the activity takes the form of a long range plant breeding program, the year-to-year needs of the grower are also served.

Perhaps the most evident service provided by the Agricultural Research Department is the extensive program of variety testing. Each year, in the areas where sugar beets are contracted by Spreckels Sugar Company we make an attempt to place comparative tests in representative growers' fields to maintain a constant check on standard varieties as well as introduce new and improved varieties. These tests are placed in such a manner as to test the performance of both commercial and new experimental varieties under every soil and climatic condition occurring in the territory in which Spreckels contracts beets. At first thought it might appear that since we operate only in California these differences would be slight. Closer consideration, however, reveals that, while the geographic area covered is not great, it includes some wide differences in both soil and climate; from the cool, humid coastal areas to the hot dry summer climates of parts of the interior valleys, and warm humid areas of certain other parts, and from light soils in a few areas, through heavy clay and adobe type soils

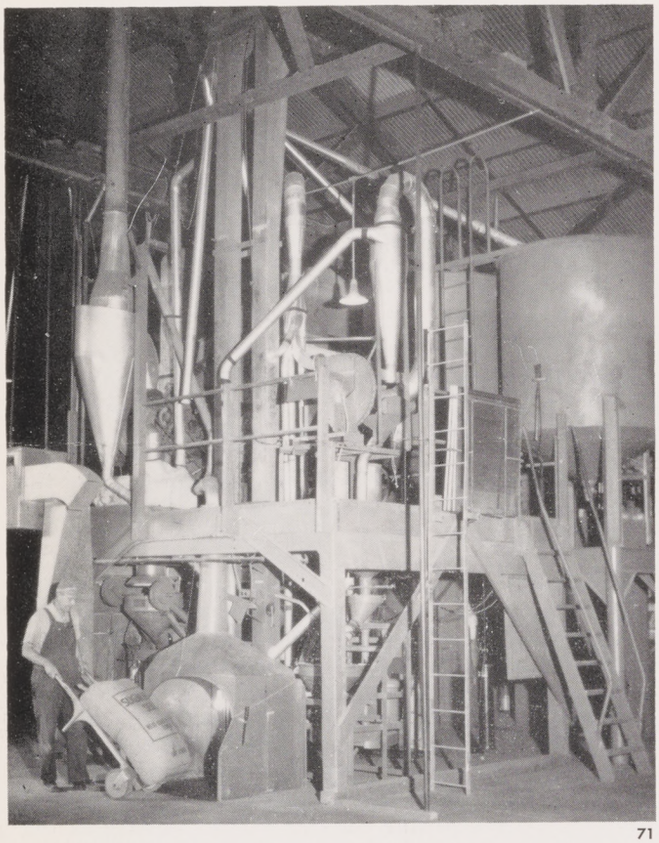


PHOTOGRAPHY, both movies and stills, aids research. Austin Armer films seedling sugar beet growth.

GRAFTING TECHNIQUE developed by Dr. Johnson opens up a vast new field of hybridization with sugar beet "cousins" possessing many valuable characteristics. At the left is a thriving hybrid.

70

VARIETY PLOT harvesting and sampling is an unending job for Agronomist Larry Burtch.



71

SEED PROCESSING stations, like this one at Woodland, bring the grower a final product which began as a research project.

in many areas, to the organic peat soils of the Delta region. We place great value on the information derived from tests under all of these conditions. More and more evidence is accumulating that some strains or varieties of sugar beets are somewhat specific in the environmental requirements necessary to produce a maximum crop. In other words, because a variety does particularly well in one area, it is not a certainty that it will perform satisfactorily in other areas. This must be determined by testing under all conditions and we intend to continue our extensive testing program in an effort to provide seed of the best varieties available for each condition under which we contract beets.

A few of our projects might be mentioned to demonstrate the effects of some specific conditions on varietal requirements. In some areas it is advantageous for certain reasons to seed beets as early as December or even earlier. Certainly one of the requirements for a variety to be planted that early would be that it would not readily produce seed stalks, so evident in many early planted fields. Selections have been made and new varieties developed that can successfuly be planted at that date with very few seed stalks in the resulting crop. Other extremely low bolting varieties are being tested in the San Joaquin Valley to determine if varieties can be developed with enough bolting resistance to be planted in the fall for harvest the following summer. Another application for these extremely low bolting varieties would be for use in those areas where beets are kept in the ground through the winter. As soon as the temperatures rise in the spring and the days become longer, present varieties begin to produce seed stalks. In some cases, these become a rather serious problem before the beets can all be harvested. Some of our new extremely low bolting strains show promise of retarding this bolting to the extent of two to three weeks in the spring. This would allow that much additional time for harvest without trouble from seedstalks. These are some of the advantages and possible uses for some of our new extremely low bolting material.

In certain limited areas of the Sacramento Valley for the past few years we have had some trouble with a leaf spot disease. This particular leaf spot has been known for many years in some of the sugar beet growing areas of the United States but until recently it has not been a problem in any of Spreckels' areas. Because it has been recognized in some beet growing areas for some time, a great deal of work has been done in developing varieties resistant to it by governmental agencies and sugar companies operating in affected areas. Some of these varieties are available to us. Most are not suitable as such for our conditions and work is underway to make them more fitted for our use. Selections have been made on one of these varieties, in which both curly top and leaf spot resistance have been combined, to make it more resistant to bolting. Seed from this selection will be tested in the crop year of 1955 in those areas subject to attack by leaf spot to determine its performance.

Downy mildew, caused by a fungus, is a disease which occurs periodically in a fairly localized area quite near the coast. In Districts II and III this disease is rarely a problem. The cool, humid, coastal climate characteristics of much of District I is conducive to the development of this disease. Selections have been made in some of our otherwise desirable varieties to increase their resistance to this fungus. A seed increase is now being made of one of the most promising lines resulting from this selection program.

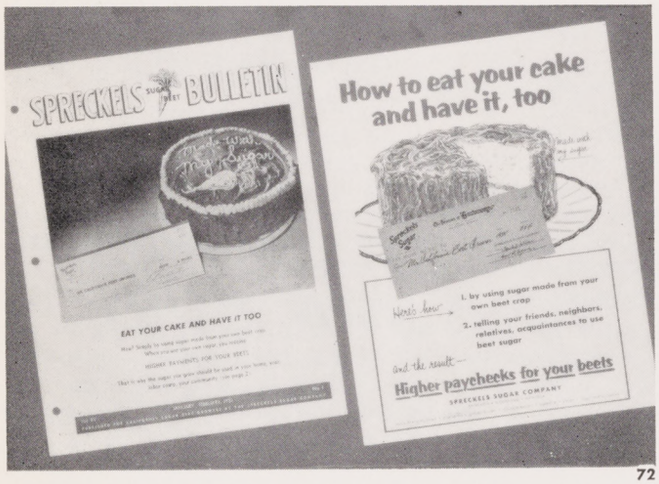
One of the most severe insect or disease problems in our sugar beet areas at present is that of the sugar beet nematode. The only economically feasible methods now used to avoid serious damage from this pest in infested areas are long rotations between successive beet crops and early planting. Considerable effort is now being put forth in an effort to more effectively combat this pest as pointed out by Mr. G. D. Manuel in the July-August 1954 issue of the Spreckels Bulletin. In our own company we have initiated a project of trying to incorporate inherent resistance to the sugar nematode into strains of sugar beets. A few wild species of beets are known to be immune to attack by the sugar beet nematode. These can be crossed with the

(Continued on Page 48)

HOW TO EAT YOUR CAKE AND HAVE IT TOO

By WILLIAM H. OTTEY
Vice President in Charge of Sales, Spreckels Sugar Company

YOU HAVE all seen these illustrations before. The first appeared on the cover of the January-February, 1951 issue of the "Spreckels Sugar Beet Bulletin." The second was used in Spreckels Sugar Company's ad in the 1953 edition of "The California Sugar Beet," published by the California Beet Growers' Association. We feel the message conveyed by the illustrations is as important to you, our beet growers, now as it was in 1951 and in 1953 and I value the opportunity to elaborate upon it.



72

What lies behind these illustrations is a problem of supply and demand. As of today, the five western states of California, Oregon, Washington, Nevada, and Arizona—the "home" market for Spreckels sugar—produce more sugar than their 17,500,000 people consume. In 1953, for example, estimated cane sugar production at Crockett, California (refined from Hawaiian raw sugar) was 14,600,000 100-pound bags. Added to that were more than 12,500,000 bags of beet sugar produced by 14 factories in the three Pacific Coast states (11 of them in California), making the total supply about 27,000,000 bags of sugar. But only 18,900,000 bags of sugar were consumed in the five western states last year. The remaining 8,000,000-plus bags had to be shipped at considerable expense to markets in other states. And in some of these markets sugar prices are traditionally lower than they are in the markkets relatively close to our factories.

But why should this be of concern to you, a beet grower? Isn't this excessive supply in relation to local demand a problem that falls on the processor alone? A quick review of the grower contracts of all California processors answers these questions. These contracts provide that compensation to the grower shall be computed on the net selling price obtained from the sale of sugar. This net selling price results from deducting certain costs from the amount actually received from buyers. Included in the items deducted is the difference between the freight paid by the buyer on his invoice and the freight paid by the processor to get the sugar to the buyer.

Why are these not the same—freight charged the buyer and freight paid the carrier for the delivery service? In some markets they are. But in other markets where California-produced beet sugar must find a buyer, the freight paid by the buyer, being based on the freight cost of a supplier located closer to the destination than we are, is considerably less than the amount actually paid to move the sugar from California factories to the destination in question. Here is an example: At St. Louis, Missouri, where the delivered price includes freight of approximately $.46 based on the rate from New Orleans, a California shipper must pay $1.06 for the longer haul, and absorb the difference ($.60) on each 100-pound bag in order to compete. This reduces the net selling price accordingly.

Not only does the cost of shipping sugar to markets outside the five western states adversely effect the company's selling price; but also, as noted above, at any given time prices obtained for sugar in many of these distant markets are generally below sugar prices prevailing in our natural market area. Thus on January 1, 1954 and at the present writing, as well as for most of the intervening period, a 100-pound bag of sugar commanded a basic price of $.30 less in midwestern markets than in San Francisco. The effect on a California company's net selling price of sugar sales in Rocky Mountain and midwestern markets is obvious. It follows that processors and growers have a common interest in increasing distribution of beet sugar in the five western states.

Take the state of California alone. In 1953 its people and industries consumed 14,595,154 bags of sugar. Its beet sugar production was 9,125,000 bags. Clearly, then, this production could have been consumed within the state—but it was not. In that year California consumed 6,962,419 bags of its home product, sugar from sugar beets.

What can be done to gain increased consumption of beet sugar in general and of Spreckels Sugar in particular here in California? As of today about 80 percent of the California beet industry's sales are to industrial sugar users—canners, bottlers, bakers, and the like. Only about 20 percent of its sales are to household consumers. It would seem that if the California beet processor is to sell a greater share of its production within the state, it must look to the household consumer for a substantial part of the sales increase. For this reason Spreckels is vigorously promoting its full line of consumer packages — its packets of granulated sugar and its one-pound cartons of specialty sugars. For we realize that even a modest percentage increase of total consumer sales here in California would have a salutary effect on our net selling price.

A word of optimism should be inserted here. The

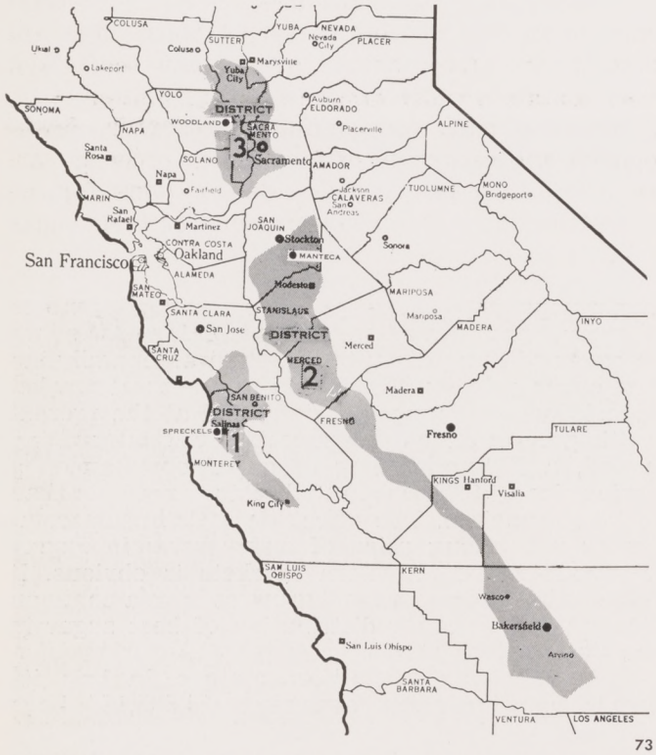
(Continued on Page 48)

SUGAR BEET RECEIVING FACILITIES

By AUSTIN ARMER

Agricultural Engineer, Spreckels Sugar Company

THE THIRTY-THREE receiving stations operated by the Spreckels Sugar Company are the embodiment of the company's policy of minimizing the grower's cost and effort of delivering his beets. These receiving stations represent a capital investment of well over $1,000,000, and the employment of nearly 200 trained employes during the harvest season. This entire outlay is borne by the Spreckels Sugar Company. Growers are not requested to participate in any way in the cost.



73

THE SHADED areas are those where beets are received from Spreckels growers. The 33 receiving stations are strategically located to minimize hauling distance, which averages 9.5 miles.

FUNCTIONS OF A RECEIVING STATION:

The physical functions of a receiving station are fairly simply otulined as follows:

1. Weigh the loaded beet truck.
2. Unload the beets into the receiving hopper.
3. Elevate and clean the beets.
4. Weigh the dirt removed from the beets.
5. Take a sample from each load for sugar and tare analysis.
6. Load the beets into a railroad car or transport truck.
7. Weigh the empty truck and record the first net weight of beets delivered.

In addition to these physical operations which take place at the receiving station, there is a complex system of accounting, and of sugar and tare analysis set up for the purpose of accurately paying the grower for the actual sugar represented by each truck-load of beets.

Indeed the tare laboratory which analyzes the sample for sugar percent and percent clean beets is as much a part of the receiving system as is the accounting office which calculates beet payments to growers or the actual physical installation at the receiving station. For a detailed description of the tare laboratory and accounting functions, reference is made to the SPRECKELS SUGAR BEET BULLETIN for September-October 1951 (volume 15, no. 5, page 38), under the heading of "Sugar Beet Sample Determines Payments to Growers."

To insure maximum accuracy of sampling and analysis, the company's General Chemist visits each receiving station and tare laboratory periodically. His work is supplemented by inspections of

74

RECEIVING STATIONS—thirty-three of them—are the visible plant of the Company's beet receiving facilities. Unseen is the complex system of taring, sugar analysis and accounting which guarantees accurate payment for beets received.

all receiving stations by the Agricultural Engineer, who makes certain that all weighing and sampling operations are properly executed, and that maximum mechanical efficiency and safety standards are maintained. Finally, all scales are periodically tested and certified by deputies of the State Sealer of Weights and Measures. To pass their rigorous tests, each truck or dirt scale must prove accurate to 1/10 of 1% or better.

As a final and overall check on the accuracy of all receiving station and tare laboratory operations, the field inspectors of the California Beet Growers' Association make frequent inspection visits and report their findings to both the processor and the Association.

RECEIVING STATION MANAGEMENT:

The 33 receiving stations of the Spreckels Sugar Company represent a physical plant quite as complex as many complete food processing factories. The management of all these facilities is the direct responsibility of the Field Superintendents. These representatives of the Company—there are twenty of them—are in full charge of receiving stations operation. They hire the receiving station employes, and are responsible for all records as well as physical operations. Maintenance is also their responsibility, and the company provides mechanical service, regardless of the remoteness of the station.

Maintenance and construction headquarters are located at Sacramento and Spreckels. They are manned by a staff of 18 mechanics, welders and electricians under the direction of two District Engineers, Julian Williams at Sacramento, and Walter Gerow at Spreckels.

Facilities include well equipped shops, stores of repair parts, and a fleet of trucks, fully equipped for cutting, welding and all other field operations.

The maintenance of these receiving stations involves a great deal more than lubrication, adjustment and replacing worn parts. It means that all of the receiving stations must be periodically modernized to meet the changing requirements imposed by improvements in cultural methods. For example, it has been necessary to install new and larger truck scales during the past few years in order to accommodate the very much larger beet trucks which have come into use. Numerous changes in beet dump design have been made to accommodate mechanically harvested beets. The physical nature of mechanically harvested beets differs in several ways from that of hand-harvested beets. They are more brittle, they include more small beets, and they contain a wider range of foreign matter. Such a situation calls for continuing research, development and rebuilding of facilities in order to carry out the company's policy that growers for the Spreckels Sugar Company may deliver their sugar beets at the minimum of cost and effort.

75

AFTER DARK at a Spreckels Receiving Station. The driver of the sample truck picks up the day's samples, leaves a supply of sample bags, and other needed sundries, and speeds the samples to the nearest tare laboratory.

76

THE SACRAMENTO agricultural yard is headquarters for maintenance of the 2 8 receiving stations in Districts 2 and 3. It is staffed by District Engineer Julian Williams and 16 mechanics, electricians, and truck drivers. District Engineer W alter Gerow has a proportionate staff serving District 1 at Spreckels.

RESEARCH

(Continued from Page 44)

common sugar beet, but the seedlings produced from such a cross are unthrifty and die at an early stage because they are unable to produce a root with which to absorb nutrients from the soil. We have devised a grafting technique by which these hybrid seedlings can be transplanted onto sugar beets and then go ahead and develop normally. The value of this technique is not with the thought of producing commercial beets from grafted seedlings, but to enable the hybrid seedlings to live long enough to produce seed. It seems possible that plants in the segregating offspring from such hybrids might be selected which would be of the sugar beet type and also possess the nematode resistance of the wild ancestor. Grafted plants have grown to produce flowers, but these have been sterile. Attempts are now underway to induce fertility in these plants.

These are just a few of the projects under way in the Agricultural Research program of Spreckels Sugar Company. Others include fertilizer trials, methods of weed control, cultural and varietal improvements. These are all carried on in an attempt to provide the best possible research service to growers in all of Spreckels beet growing areas.

EAT YOUR CAKE

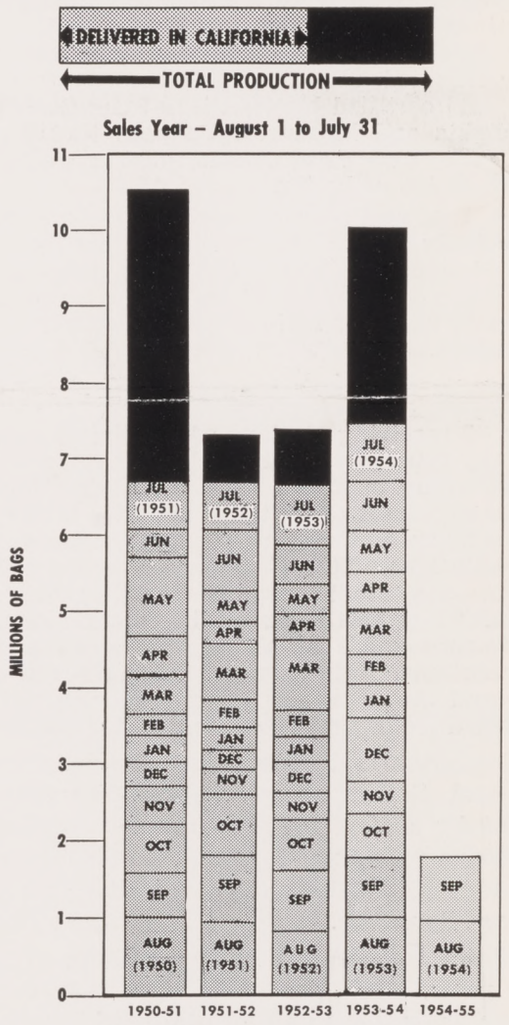
(Continued from Page 45)

growing population of the five western states, particularly California, provides justification for concluding that the day may come when sugar supplies and sugar consumption in this area are in relative balance. Between 1940 and 1950 the population of these five states increased at the rate of almost 500,000 people a year. Since 1950 the annual rate of increase here has been close to 600,000 people. If this trend continues, and the volume of sugar consumed per capita does not change appreciably, we can expect the demand for sugar in this area to increase by between 500,000 and 600,000 bags per year. So the long-term prospects in our natural market area are encouraging.

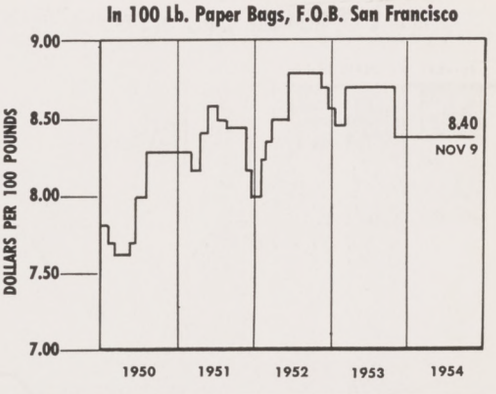
But it is with the present that we must be concerned. Since beet growers share in the proceeds from the sale of sugar, it follows that in their own self-interest they will want to do whatever they can to maximize their processor's net selling price.

That is why Spreckels Sugar Company urges you always to buy and use its sugar—your sugar—both in your homes and in your labor camps, and to ask your friends and neighbors to do likewise. By doing so you are in effect putting money into your own pocket, as well as investing in the prosperity of the state. Hence this request is really an invitation to "eat your cake and have it, too."

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR



77

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AUSTIN ARMER, Editor 600 California Fruit Building Sacramento, California

INDEX TO VOL. 18, 1954